

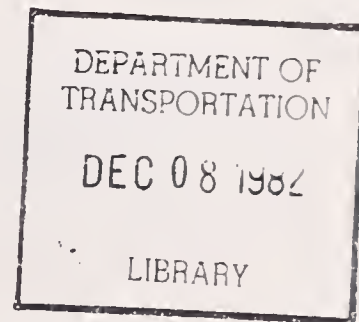
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# Profiles of Major Suppliers to the Automotive Industry

## Volume 5: Multinational Automotive Parts and Components Suppliers

J.A. Mateyka  
W.R. Magro  
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Booz, Allen and Hamilton, Inc.  
Transportation Consulting Division  
Bethesda MD 20014

August 1982  
Final Report

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| 16. Abstract<br><br>This study summarizes extensive information collected over a two-year period (October 1978 to October 1980) on suppliers of parts and components, materials, and machine tools to the automotive industry in the United States. The objective of the study was to provide data and information in support of analyses of the U.S. automotive industry. The results of this effort are published in seven volumes --- Volume I: Overview; Volume II: Iron, Steel, and Aluminum Suppliers to the Automotive Industry; Volume III: Plastics, Glass, and Fiberglass Suppliers to the Automotive Industry; Volume IV: North American Parts and Component Suppliers to the Automotive Industry; Volume V: Multinational Automotive Parts and Components Suppliers; Volume VI: Foreign Automotive Parts and Components Suppliers; and Volume VII: Machine Tool Suppliers to the Automotive Industry. |  |  |  |  |           |
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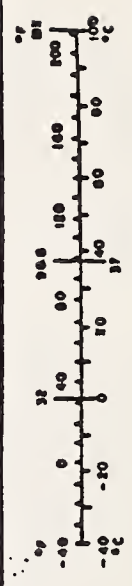
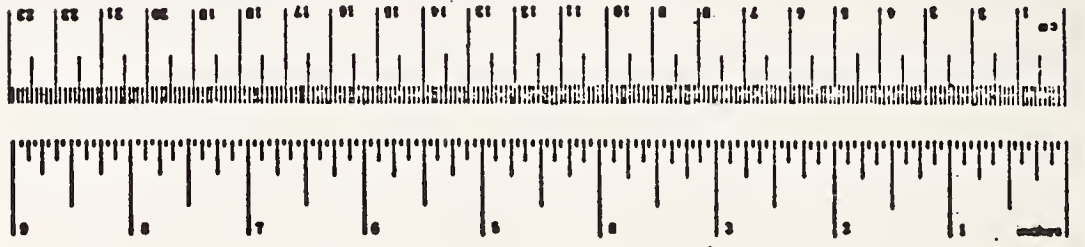
Automobile manufacturers, in general, produce only selected, key elements and subassemblies for their final product, and rely on a widespread and complex logistics network including material suppliers, foundries and fabricators for wide variety of other necessary components going into the finished automobile.

Because of the importance of the automobile industry to the United States and to the world economy, it is important to understand the makeup of the logistics infrastructure and to understand its internal interrelationships and workings with the industry it supports.

The purpose of this study was to gather all possible and pertinent information on suppliers to the automotive industry, and to present it in a form for ease of reference and further analysis.

METRIC CONVERSION FACTORS

| Approximate Conversions to Metric Measures |                        |                |                     | Approximate Conversions from Metric Measures |                                   |               |                        |
|--|------------------------|----------------|---------------------|--|-----------------------------------|---------------|------------------------|
| Symbol                                     | When You Know          | Multiply by    | To Find             | Symbol                                       | When You Know                     | Multiply by   | To Find                |
| <b>LENGTH</b>                              |                        |                |                     |  |                                   |               |                        |
| m  | inches                 | 2.5            | centimeters         | cm   | millimeters                       | 0.04          | inches                 |
| ft   | feet                   | 30             | centimeters         | m  | centimeters                       | 0.0           | inches                 |
| yd   | yards                  | 0.9            | meters              | m  | meters                            | 3.3           | feet                   |
| mi   | miles                  | 1.6            | kilometers          | km   | kilometers                        | 0.6           | miles                  |
| <b>AREA</b>                                |                        |                |                     |  |                                   |               |                        |
| m <sup>2</sup>                             | square inches          | 0.6            | square centimeters  | cm <sup>2</sup>                              | square centimeters                | 0.16          | square inches          |
| ft <sup>2</sup>                            | square feet            | 0.09           | square meters       | m <sup>2</sup>                               | square meters                     | 1.2           | square yards           |
| yd <sup>2</sup>                            | square yards           | 0.8            | square meters       | m <sup>2</sup>                               | square kilometers                 | 0.4           | square miles           |
| ac <sup>2</sup>                            | square miles           | 2.6            | square kilometers   | km <sup>2</sup>                              | hectares (10,000 m <sup>2</sup> ) | 2.6           | square miles           |
| ac <sup>2</sup>                            | acres                  | 0.4            | hectares            | ha   |                                   |               |                        |
| <b>MASS (weight)</b>                       |                        |                |                     |  |                                   |               |                        |
| oz   | ounces                 | 28             | grams               | g  | grams                             | 0.035         | ounces                 |
| lb   | pounds                 | 0.45           | kilograms           | kg   | kilograms                         | 2.2           | pounds                 |
|  | short tons (2000 lb)   | 0.9            | tonnes              | t  | tonnes (1000 kg)                  | 1.1           | short tons             |
| <b>VOLUME</b>                              |                        |                |                     |  |                                   |               |                        |
| lsp  | teaspoons              | 5              | milliliters         | ml   | milliliters                       | 0.03          | fluid ounces           |
| fl oz                                      | fluid ounces           | 30             | milliliters         | ml   | liters                            | 2.1           | pints                  |
| c  | cup                    | 0.24           | liters              | l  | liters                            | 1.06          | quarts                 |
| pt   | pint                   | 0.47           | liters              | l  | cubic meters                      | 35            | cubic feet             |
| qt   | quart                  | 0.95           | liters              | l  | cubic meters                      | 1.3           | cubic yards            |
| gal  | gallon                 | 3.8            | liters              | m <sup>3</sup>                               |                                   |               |                        |
| cu ft                                      | cubic feet             | 0.03           | cubic meters        | m <sup>3</sup>                               |                                   |               |                        |
| cu yd                                      | cubic yards            | 0.76           | cubic meters        | m <sup>3</sup>                               |                                   |               |                        |
| <b>TEMPERATURE (degrees)</b>               |                        |                |                     |  |                                   |               |                        |
| °f   | Fahrenheit temperature | 5/9 (minus 32) | Celsius temperature | °C   | Celsius temperature               | 9/5 (plus 32) | Fahrenheit temperature |



## TABLE OF CONTENTS

| <u>Section</u>   | <u>Page<br/>Number</u> |
|--|------------------------|
| SUMMARY.....   | 1                      |
| 1. MULTINATIONAL PARTS AND COMPONENTS SUPPLIERS<br>TO THE AUTOMOTIVE INDUSTRY..... | 1-1                    |
| 2. BENDIX.....   | 2-1                    |
| 2.1 Corporate Size and Structure.....  | 2-1                    |
| 2.2 Major Markets and Products.....  | 2-4                    |
| 2.3 Corporate Strategy.....  | 2-9                    |
| 2.4 Production and Operations.....   | 2-10                   |
| 2.5 Financial Status.....  | 2-37                   |
| 2.6 Research and Development.....  | 2-39                   |
| 2.7 Government Relations.....  | 2-41                   |
| 2.8 Labor Relations.....   | 2-41                   |
| 3. BORG-WARNER.....  | 3-1                    |
| 3.1 Corporate Size and Structure.....  | 3-1                    |
| 3.2 Major Markets and Products.....  | 3-5                    |
| 3.3 Corporate Strategy.....  | 3-10                   |
| 3.4 Production and Operations.....   | 3-11                   |
| 3.5 Financial Status.....  | 3-40                   |
| 3.6 Research and Development.....  | 3-41                   |
| 3.7 Industry Relations.....  | 3-44                   |
| 4. BUDD.....   | 4-1                    |
| 4.1 Corporate Size and Structure.....  | 4-1                    |
| 4.2 Major Markets and Products.....  | 4-2                    |
| 4.3 Corporate Strategy.....  | 4-4                    |
| 4.4 Production and Operations.....   | 4-5                    |
| 4.5 Financial Status.....  | 4-27                   |
| 4.6 Research and Development.....  | 4-28                   |
| 4.7 Government Relations.....  | 4-29                   |
| 5. COLT INDUSTRIES.....  | 5-1                    |
| 5.1 Corporate Size and Structure.....  | 5-1                    |
| 5.2 Major Markets and Products.....  | 5-4                    |
| 5.3 Corporate Strategy.....  | 5-8                    |
| 5.4 Production and Operations.....   | 5-8                    |
| 5.5 Financial Status.....  | 5-15                   |
| 5.6 Research and Development.....  | 5-19                   |
| 5.7 Government Relations.....  | 5-19                   |

TABLE OF CONTENTS (Continued)

| <u>Section</u>                        | <u>Page<br/>Number</u> |
|---------------------------------------|------------------------|
| 6. GOODYEAR.....                      | 6-1                    |
| 6.1 Corporate Size and Structure..... | 6-1                    |
| 6.2 Major Markets and Products.....   | 6-2                    |
| 6.3 Corporate Strategy.....           | 6-5                    |
| 6.4 Production and Operations.....    | 6-5                    |
| 6.5 Financial Status.....             | 6-30                   |
| 6.6 Research and Development.....     | 6-33                   |
| 6.7 Government Relations.....         | 6-34                   |
| 6.8 Labor Relations.....              | 6-36                   |
| 7. ITT.....                           | 7-1                    |
| 7.1 Corporate Size and Structure..... | 7-1                    |
| 7.2 Major Markets and Products.....   | 7-8                    |
| 7.3 Corporate Strategy.....           | 7-11                   |
| 7.4 Production and Operations.....    | 7-12                   |
| 7.5 Financial Status.....             | 7-47                   |
| 7.6 Research and Development.....     | 7-50                   |
| 7.7 Government Relations.....         | 7-50                   |
| 8. A.O. SMITH.....                    | 8-1                    |
| 8.1 Corporate Size and Structure..... | 8-1                    |
| 8.2 Major Markets and Products.....   | 8-4                    |
| 8.3 Corporate Strategy.....           | 8-7                    |
| 8.4 Production and Operations.....    | 8-8                    |
| 8.5 Financial Status.....             | 8-12                   |
| 8.6 Research and Development.....     | 8-14                   |
| 8.7 Government Relations.....         | 8-14                   |
| 9. TRW.....                           | 9-1                    |
| 9.1 Corporate Size and Structure..... | 9-1                    |
| 9.2 Major Markets and Products.....   | 9-2                    |
| 9.3 Corporate Strategy.....           | 9-9                    |
| 9.4 Production and Operations.....    | 9-10                   |
| 9.5 Financial Status.....             | 9-18                   |
| 9.6 Research and Development.....     | 9-20                   |
| 9.7 Labor Relations.....              | 9-22                   |



## LIST OF ILLUSTRATIONS

| <u>Figure</u> |   | <u>Page<br/>Number</u> |
|---------------|---|------------------------|
| 2-1           | Bendix Corporate Organization.....                                | 2-3                    |
| 2-2           | Bendix Market Data.....   | 2-4                    |
| 2-3           | Breakdown of Bendix Automotive Revenues,<br>Fiscal Year 1978..... | 2-5                    |
| 2-4           | Fostoria Plant.....   | 2-11                   |
| 2-5           | Newport News Plant.....   | 2-12                   |
| 2-6           | Green Island Plant.....   | 2-13                   |
| 2-7           | Sydney Plant.....   | 2-14                   |
| 2-8           | South Bend Plant.....   | 2-15                   |
| 2-9           | Troy Plant.....   | 2-16                   |
| 2-10          | St. Joseph Plant.....   | 2-17                   |
| 2-11          | Windsor Plant.....  | 2-18                   |
| 2-12          | Walkersville Plant.....   | 2-19                   |
| 2-13          | Atzacapotzalco Plant.....   | 2-20                   |
| 2-14          | San Luis Potosi Plant.....  | 2-21                   |
| 2-15          | Creme Plant.....  | 2-23                   |
| 2-16          | Ferdinand-Porsche-Strasse Plant.....                              | 2-24                   |
| 2-17          | Leverkusin Plant.....   | 2-25                   |
| 2-18          | Glinde bei Hamburg Plant.....                                     | 2-26                   |
| 2-19          | Barcelona Plant.....  | 2-27                   |
| 2-20          | Bristol Plant.....  | 2-28                   |
| 2-21          | Clichy Plant.....   | 2-29                   |
| 2-22          | Caracas Plant.....  | 2-30                   |
| 2-23          | Buenos Aires Plant.....   | 2-31                   |

LIST OF ILLUSTRATIONS (Continued)

| <u>Figure</u> |   | <u>Page<br/>Number</u> |
|---------------|---|------------------------|
| 2-24          | Campinas Plant.....                     | 2-32                   |
| 2-25          | Ballarat Plant.....                     | 2-33                   |
| 2-26          | Rockdale Plant.....                     | 2-34                   |
| 2-27          | Tokyo (1) Plant.....                    | 2-35                   |
| 2-28          | Tokyo (2) Plant.....                    | 2-36                   |
| 2-29          | Bendix Operations Analysis.....         | 2-38                   |
| 2-30          | Bendix Capital Analysis.....            | 2-40                   |
| 3-1           | Borg-Warner Corporate Organization..... | 3-3                    |
| 3-2           | Borg-Warner Market Data.....            | 3-6                    |
| 3-3           | Sterling Heights Plant.....             | 3-12                   |
| 3-4           | Chicago Plant.....                      | 3-13                   |
| 3-5           | Coldwater Plant.....                    | 3-14                   |
| 3-6           | Burlington Plant.....                   | 3-15                   |
| 3-7           | Decatur Plant.....                      | 3-16                   |
| 3-8           | New Bedford Plant.....                  | 3-17                   |
| 3-9           | Rockford Clutch Plant.....              | 3-18                   |
| 3-10          | Rockford Drive Line Plant.....          | 3-19                   |
| 3-11          | Ballwin Plant.....                      | 3-20                   |
| 3-12          | Blytheville Plant.....                  | 3-21                   |
| 3-13          | Decatur Plant.....                      | 3-22                   |
| 3-14          | Dixon Plant.....                        | 3-23                   |
| 3-15          | Ithaca Plant.....                       | 3-24                   |
| 3-16          | Keokuk Plant.....                       | 3-25                   |
| 3-17          | Bellwood Plant.....                     | 3-26                   |

LIST OF ILLUSTRATIONS (Continued)

| <u>Figure</u> |  | <u>Page<br/>Number</u> |
|---------------|--|------------------------|
| 3-18          | Frankfort Plant.....                   | 3-27                   |
| 3-19          | Madrid Plant.....                      | 3-30                   |
| 3-20          | Heidelberg Plant.....                  | 3-31                   |
| 3-21          | Anjo Plant.....                        | 3-32                   |
| 3-22          | Daito Plant.....                       | 3-33                   |
| 3-23          | Uitenhage Plant.....                   | 3-34                   |
| 3-24          | Guadalajara Plant.....                 | 3-35                   |
| 3-25          | Fairfield Plant.....                   | 3-36                   |
| 3-26          | Albury Plant.....                      | 3-37                   |
| 3-27          | Kenfig Plant.....                      | 3-38                   |
| 3-28          | Sao Paulo Plant.....                   | 3-39                   |
| 3-29          | Operating Analysis of Borg-Warner..... | 3-42                   |
| 3-30          | Capital Analysis of Borg-Warner.....   | 3-43                   |
| 4-1           | Market Data for Budd.....              | 4-2                    |
| 4-2           | Detroit Plant.....                     | 4-6                    |
| 4-3           | Gary Plant.....                        | 4-7                    |
| 4-4           | Philadelphia Plant.....                | 4-8                    |
| 4-5           | Kitchener Plant.....                   | 4-9                    |
| 4-6           | Milford Fabricating Co. Plant.....     | 4-10                   |
| 4-7           | Polymer Composites Division.....       | 4-11                   |
| 4-8           | Ashland Plant.....                     | 4-12                   |
| 4-9           | North Baltimore Plant.....             | 4-13                   |
| 4-10          | Clinton Plant.....                     | 4-14                   |
| 4-11          | Detroit Plant (2).....                 | 4-15                   |

LIST OF ILLUSTRATIONS (Continued)

| <u>Figure</u> |   | <u>Page<br/>Number</u> |
|---------------|---|------------------------|
| 4-12          | Frankfort Plant.....                        | 4-16                   |
| 4-13          | Carey Plant.....                            | 4-17                   |
| 4-14          | Van Wert Plant.....                         | 4-18                   |
| 4-15          | São Paulo Plant.....                        | 4-21                   |
| 4-16          | Recife Plant.....                           | 4-22                   |
| 4-17          | Mexicali Plant.....                         | 4-23                   |
| 4-18          | Buenos Aires Plant.....                     | 4-24                   |
| 4-19          | Tlalnepantla Plant.....                     | 4-25                   |
| 4-20          | San Martin Plant.....                       | 4-26                   |
| 5-1           | Colt Industries Corporate Organization..... | 5-3                    |
| 5-2           | Colt Market Data.....                       | 5-5                    |
| 5-3           | Holley Headquarters Data.....               | 5-10                   |
| 5-4           | Paris Plant Data.....                       | 5-11                   |
| 5-5           | Bowling Green Plant Data.....               | 5-12                   |
| 5-6           | Water Valley Plant Data.....                | 5-13                   |
| 5-7           | Sallisaw Plant Data.....                    | 5-14                   |
| 5-8           | Colt Operating Analysis.....                | 5-17                   |
| 5-9           | Colt Capital Analysis.....                  | 5-18                   |
| 6-1           | Market Data for Goodyear.....               | 6-2                    |
| 6-2           | Union City Plant.....                       | 6-6                    |
| 6-3           | Topeka Plant.....                           | 6-7                    |
| 6-4           | Scottsboro Plant.....                       | 6-8                    |
| 6-5           | Luckey Plant.....                           | 6-9                    |
| 6-6           | Logan Plant.....                            | 6-10                   |

LIST OF ILLUSTRATIONS (Continued)

| <u>Figure</u> |                                   | <u>Page<br/>Number</u> |
|---------------|-----------------------------------|------------------------|
| 6-7           | Jackson Plant.....                | 6-11                   |
| 6-8           | Gadsden Plant.....                | 6-12                   |
| 6-9           | Danville Plant.....               | 6-13                   |
| 6-10          | Cartersville Plant.....           | 6-14                   |
| 6-11          | Bakersfield Plant.....            | 6-15                   |
| 6-12          | Akron Plant.....                  | 6-16                   |
| 6-13          | Sun Prairie Plant.....            | 6-17                   |
| 6-14          | Stow Plant.....                   | 6-18                   |
| 6-15          | Cumberland Plant.....             | 6-19                   |
| 6-16          | Fayetville Plant.....             | 6-20                   |
| 6-17          | Freeport Plant.....               | 6-21                   |
| 6-18          | Lansing Plant.....                | 6-22                   |
| 6-19          | Ypsilanti Plant.....              | 6-23                   |
| 6-20          | Mendota Plant.....                | 6-24                   |
| 6-21          | Newark Plant.....                 | 6-25                   |
| 6-22          | Goodyear Operations Analysis..... | 6-31                   |
| 6-23          | Goodyear Capital Analysis.....    | 6-32                   |
| 7-1           | ITT Corporate Organization.....   | 7-3                    |
| 7-2           | ITT Automotive Market Data.....   | 7-9                    |
| 7-3           | Tonawanda Plant Data.....         | 7-13                   |
| 7-4           | Holly Springs Plant Data.....     | 7-14                   |
| 7-5           | Valdosta Plant Data.....          | 7-15                   |
| 7-6           | Bainbridge Plant Data.....        | 7-16                   |
| 7-7           | North Vernon Plant Data.....      | 7-17                   |

LIST OF ILLUSTRATIONS (Continued)

| <u>Figure</u> |                                   | <u>Page<br/>Number</u> |
|---------------|-----------------------------------|------------------------|
| 7-8           | Valdosta (2) Plant Data.....      | 7-18                   |
| 7-9           | Jackson Plant Data.....           | 7-19                   |
| 7-10          | Selmer Plant Data.....            | 7-20                   |
| 7-11          | Cairo Plant Data.....             | 7-21                   |
| 7-12          | Drew Plant Data.....              | 7-22                   |
| 7-13          | Lake City Plant Data.....         | 7-23                   |
| 7-14          | Ardel Plant Data.....             | 7-24                   |
| 7-15          | Gifhorn Plant.....                | 7-26                   |
| 7-16          | Rheinböllerrhutte Plant.....      | 7-27                   |
| 7-17          | Frankfurt Plant.....              | 7-28                   |
| 7-18          | Metallwarenfabrik Plant.....      | 7-29                   |
| 7-19          | Hydraulics Division Plant.....    | 7-30                   |
| 7-20          | Mechelen Plant.....               | 7-31                   |
| 7-21          | Alfred Teves Ltd. Plant.....      | 7-32                   |
| 7-22          | Alfred Teves France Plant.....    | 7-33                   |
| 7-23          | Galfer Plant.....                 | 7-34                   |
| 7-24          | Alfred Teves Do Brasil Plant..... | 7-35                   |
| 7-25          | Culpeper Plant.....               | 7-36                   |
| 7-26          | Way Assauto Plant.....            | 7-37                   |
| 7-27          | Altissimo Plant.....              | 7-38                   |
| 7-28          | D.P.A. Plant.....                 | 7-39                   |
| 7-29          | Descam Plant.....                 | 7-40                   |
| 7-30          | Gallino Plants.....               | 7-41                   |
| 7-31          | Sirtal Plant.....                 | 7-42                   |

LIST OF ILLUSTRATIONS (Continued)

| <u>Figure</u> |  | <u>Page<br/>Number</u> |
|---------------|--|------------------------|
| 7-32          | Ulma Plant.....                        | 7-43                   |
| 7-33          | Hellebore Plant.....                   | 7-44                   |
| 7-34          | Fispa Plant.....                       | 7-45                   |
| 7-35          | Ind. Riunite Plant.....                | 7-46                   |
| 7-36          | ITT Operations Analysis.....           | 7-48                   |
| 7-37          | ITT Capital Analysis.....              | 7-49                   |
| 8-1           | A.O. Smith Corporate Organization..... | 8-3                    |
| 8-2           | A.O. Smith Market Data.....            | 8-4                    |
| 8-3           | Milwaukee Plant Data.....              | 8-9                    |
| 8-4           | Granite City Plant Data.....           | 8-10                   |
| 8-5           | Milan Plant Data.....                  | 8-11                   |
| 8-6           | A.O. Smith Operations Analysis.....    | 8-13                   |
| 8-7           | A.O. Smith Capital Analysis.....       | 8-15                   |
| 9-1           | TRW Corporate Organization.....        | 9-3                    |
| 9-2           | Market Data for TRW.....               | 9-2                    |
| 9-3           | Car and Truck Sales by Market.....     | 9-4                    |
| 9-4           | Sterling Heights Plant.....            | 9-13                   |
| 9-5           | Thompson Products Plant.....           | 9-14                   |
| 9-6           | Ramsey Corporation Plant.....          | 9-15                   |
| 9-7           | TRW Valve Division Plant.....          | 9-16                   |
| 9-8           | TRW Operating Analysis.....            | 9-19                   |
| 9-9           | TRW Capital Analysis.....              | 9-21                   |

## LIST OF TABLES

| <u>Table</u> |  | <u>Page<br/>Number</u> |
|--------------|--|------------------------|
| 1-1          | MULTINATIONAL PARTS AND COMPONENT SUPPLIERS.....                                   | 1-2                    |
| 1-2          | DISTRIBUTION OF OEM TIRE SALES.....  | 1-3                    |
| 1-3          | FIRMS SELECTED FOR ANALYSIS IN THIS REPORT.....                                    | 1-3                    |
| 2-1          | BENDIX REVENUES, PROFIT AND EMPLOYMENT.....  | 2-1                    |
| 2-2          | BENDIX SALES AND PROFITS BY BUSINESS SEGMENT,<br>1979.....                         | 2-4                    |
| 3-1          | BORG-WARNER CORPORATION REVENUES, PROFIT AND<br>EMPLOYMENT.....                    | 3-1                    |
| 3-2          | DISTRIBUTION OF SALES AND PROFITS BY PRODUCT<br>GROUP.....                         | 3-4                    |
| 3-3          | DISTRIBUTION OF BORG-WARNER SALES BY MARKET.....                                   | 3-6                    |
| 3-4          | SALES OF THE TRANSPORTATION EQUIPMENT GROUP<br>OF BORG-WARNER BY MARKET, 1978..... | 3-7                    |
| 5-1          | COLT INDUSTRIES REVENUES, PROFIT AND EMPLOYMENT...                                 | 5-2                    |
| 5-2          | COLT SALES BY CLASS OF PRODUCTS.....   | 5-5                    |
| 6-1          | GOODYEAR REVENUES, PROFIT AND EMPLOYMENT.....                                      | 6-1                    |
| 6-2          | MARKET SHARE, OEM MARKET, 1978.....  | 6-3                    |
| 6-3          | BRAND SHARES OF REPLACEMENT PASSENGER TIRE<br>MARKET, 1978.....                    | 6-3                    |
| 6-4          | GOODYEAR'S MAJOR FOREIGN TIRE PLANTS.....  | 6-28                   |
| 7-1          | ITT REVENUES, PROFIT AND EMPLOYMENT.....   | 7-1                    |
| 7-2          | ITT GROUPS' SALES AND PROFITS, 1979.....   | 7-2                    |
| 7-3          | ITT AUTOMOTIVE CUSTOMERS.....  | 7-9                    |
| 8-1          | A.O. SMITH REVENUES, PROFIT AND EMPLOYMENT.....                                    | 8-2                    |
| 8-2          | SALES BREAKDOWN BY MAJOR PRODUCT GROUP,<br>1974 TO 1979.....                       | 8-5                    |
| 8-3          | ANNUAL CAR AND TRUCK FRAME PRODUCTION,<br>1975 TO 1979.....                        | 8-6                    |



LIST OF TABLES (Conintued)

| <u>Table</u> |   | <u>Page<br/>Number</u> |
|--------------|---|------------------------|
| 9-1          | TRW REVENUES, PROFIT AND EMPLOYMENT STATISTICS..... | 9-1                    |
| 9-2          | TRW SALES AND PROFITS BY MARKET IN 1979.....        | 9-4                    |
| 9-3          | TRW CAR AND TRUCK STRATEGY.....                     | 9-11                   |



## SUMMARY

This report of multinational parts and components suppliers to the automotive industry is one of seven reports on companies that supply materials, parts and components, and machine tools to automotive manufacturers. It is part of a major study being sponsored by the U.S. Department of Transportation, Transportation Systems Center (DOT/TSC), to gather and assess publicly available information on the behavior and response of major materials, parts and components, and machine tool suppliers to changing conditions in the automotive industry.

### STUDY BACKGROUND AND OBJECTIVES

This study is being undertaken to help government decision makers increase their understanding of transportation related industries and to provide them with basic industry information. The information should prove useful in the evaluation of economic impacts caused or encouraged by government regulations. It can also help determine the economic effects of future regulations.

Recent fuel shortages and government mileage regulations are causing the major automobile manufacturers to redesign their cars and produce smaller and lighter vehicles. These changes in automotive design are leading to a change in the requirements for parts and components purchased from automotive suppliers.

Shock absorbers, for instance, will soon be replaced in many cases by MacPherson struts used in front-wheel-drive cars. Brakes are being redesigned in lighter configurations and plastic and aluminum are being used to manufacture master cylinders. In almost every part of the car new technology and new designs are being introduced. As parts and components suppliers respond to and adjust to these changes, decisions are made that can have significant economic impacts, especially on local employment trends and economic activity.

## SCOPE OF THIS REPORT

This report provides a detailed view of the response of multinational parts and components suppliers to new car needs by looking at specific companies that are important in the industry. In addition, it provides a baseline of data that can be used to track industry changes or predict industry response to future regulations.

For each company covered in this report information is provided on:

- Company size and structure, including revenues, profit and employment statistics and corporate organization
- Major markets and products, including percent of sales to the auto industry, major automotive products, sales strategy, new product plans and market strategy
- Production and operations, including location, products and employment of major automotive facilities and plans for plant expansions
- Financial status including profitability and investment return, capital spending, capital structure and working capital management
- Research and development plans, including budgets and nature of work
- Labor and government relations, including government-industry interaction and company-union interaction.

The report places special emphasis on company plants and operations, focusing heavily on the location of the plants, plant capacity, major automotive products and planned expansions to the plants. This information is of particular significance since major decisions are continually being made (e.g., decisions regarding plant shut-downs, new plant development and plant expansion) which are likely to have far-reaching impacts.

## METHODOLOGY

Information for this report was obtained, wherever possible, from published sources. These include:

- Magazine and trade journal articles
- Annual reports and 10Ks
- Security analysts' reports on companies
- Company marketing literature and advertisements
- Annual meeting speeches
- Speeches before the New York Society of Security Analysts
- Plant guidebooks.

In addition, plant-specific information generally required contacts with the companies. Some information, such as specific customers supplied by particular plants and plant capacity, was generally found to be proprietary and thus could not be included in this report. Other information, such as the location of plants that do supply a significant amount of their output to the auto industry, could usually be obtained.

## ORGANIZATION

This report is meant to be used in conjunction with the report which covered major North American suppliers of parts and components to the automotive industry. This report begins with a description of the multinational automotive companies and the methods used to select those companies analyzed for this study. The detailed company profiles follow.



## 1. MULTINATIONAL PARTS AND COMPONENTS SUPPLIERS TO THE AUTOMOTIVE INDUSTRY

The multinational parts and components suppliers are defined for this series of reports as those American-based companies with significant operations both in the United States and overseas. These companies in general participate in the same market environment as the North American suppliers,\* but sell to a greater extent in the world car market. As a result, these companies are in an excellent position to transfer technology to various parts of the world. As examples:

- TRW is able to sell rack and pinion steering systems, which it has been manufacturing in England for many years, to American companies that have switched to front-wheel-drive and need the European technology.
- Borg-Warner and Bendix provide expertise throughout the world in transmission and brake systems.
- ITT is able to use its knowledge of the American market to help its European automotive subsidiaries expand into the United States.

The selection of the specific multinational companies for study in this report was done in two steps. First, from a list of over fifty major parts and components suppliers to the auto industry, companies with significant overseas operations were selected. This list is presented in Table 1-1. Second, the companies with the largest sales to the original equipment passenger car market were chosen for further study. Table 1-2 shows distribution of OEM tire sales, identifying the major tire suppliers to auto manufacturers. In addition, companies were chosen so that:

- A broad range of products would be covered.
- Companies likely to be affected by automotive downsizing would be covered.

The selected firms are shown in Table 1-3.

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\* See "Parts and Components Industry," North American Parts and Components Suppliers, prepared by Booz, Allen & Hamilton for the Transportation Systems Center of the U.S. Department of Transportation, November 1980.

TABLE 1-1. MULTINATIONAL PARTS AND COMPONENT SUPPLIERS

| Supplier         | Estimated Sales To Auto Industry 1979* (Millions) | Total 1979 Sales (Millions) | Major Products                                 | Estimated Portion Of Sales To OEM** |
|------------------|---|-----------------------------|--|-------------------------------------|
| Bendix           | \$1,953   | \$3,829                     | Brakes, steering and fuel systems              | Medium                              |
| Rockwell         | 1,853   | 6,176                       | Plastic parts, electronics and truck parts     | High                                |
| TRW              | 1,778   | 4,560                       | Chassis, engine and steering system components | Medium                              |
| ITT              | 1,720   | 17,197                      | Disc brakes, McPherson struts                  | Medium                              |
| Borg-Warner      | 1,168   | 2,717                       | Rear axle assemblies, manual transmissions     | High                                |
| Budd             | 963***  | 1,284                       | Frames, hoods and fenders                      | High                                |
| Colt             | 535   | 2,141                       | Carburetors, intake manifolds and fuel pumps   | High                                |
| Arvin            | 325   | 493                         | Mufflers, catalytic converters                 | Medium                              |
| A. O. Smith      | 443   | 836                         | Frames and structural parts                    | High                                |
| Hoover Universal | Not Available                                     | 601                         | Aluminum and plastic products                  | --                                  |
| Stewart Warner   | Not Available                                     | 366                         | Gauges and speedometers                        | High                                |

\* Includes autos, trucks, OEM and aftermarket.

\*\* Low is less than 30%, medium is 30-70% and high is more than 70%.

\*\*\* 1977 data, latest available.



TABLE 1-2. DISTRIBUTION OF OEM TIRE SALES\*

| Company       | Percent of OEM Tire Purchases |
|---------------|-------------------------------|
| Goodyear      | 31.5                          |
| Firestone     | 23.5                          |
| Uniroyal      | 20.0                          |
| General Tire  | 13.0                          |
| B.F. Goodrich | 9.5                           |

\* Based on 1978 sales.

TABLE 1-3. FIRMS SELECTED FOR ANALYSIS IN THIS REPORT

| Company                  | Products                                    |
|--------------------------|---|
| Bendix                   | Brakes, steering systems, fuel systems      |
| Borg-Warner              | Transmissions, axle assemblies              |
| Budd                     | Frames, hoods, fenders, plastic parts       |
| Colt (Holley Carburetor) | Carburetors, intake manifolds               |
| Goodyear                 | Tires, wheels                               |
| ITT                      | Brakes, McPherson struts                    |
| A. O. Smith              | Frames, structural parts                    |
| TRW                      | Engine, chassis, steering system components |

1. BORG-WARNER TIRES & WHEELS (FROM 5000) AND TIRES  
 2. TRW ENGINE CARBS



## 2. BENDIX

Bendix is a major supplier of automotive components throughout the world. The company's major automotive product is brake systems although it also makes filters, steering systems, engine controls and machine tools. Over the last ten years, Bendix has made considerable progress in reducing its dependence on American original equipment automotive sales. This has been done by strengthening European and aftermarket automotive operations as well as improving the company's role in non-automotive industries. Bendix emphasizes its technical strengths in helping the automakers meet more stringent fuel economy and emissions standards. The company has made a major move toward electronic fuel injection and electronic engine controls. In addition, Bendix is selling the automakers transfer lines to make many of the new automotive components.

### 2.1 CORPORATE SIZE AND STRUCTURE

Bendix is one of the largest parts and components suppliers to the auto industry. The automotive business accounts for a little over half of Bendix's revenues.

#### 2.1.1 Revenue, Profit and Employment Statistics

Bendix's sales for the fiscal year ending September 30, 1979, rose 5.7 percent with profits before taxes up 12.5 percent and net income up 25 percent. (See Table 2-1.) Bendix employed approximately 76,000 people in 1979.

TABLE 2-1. BENDIX  
REVENUES, PROFIT AND EMPLOYMENT

| Year*                                      | Revenues (Millions) | Profits (Millions) |
|--|---------------------|--------------------|
| 1979                                       | \$3,856             | \$161              |
| 1978                                       | 3,649               | 130                |
| Average Number of Employees: 76,000 (1979) |                     |                    |

\* Year ended September 30.

### 2.1.2 Corporate Organization

Bendix is organized by its four major lines of business. (See Figure 2-1.)

- . Aerospace-Electronics. This group is engaged in development and technical support of products for commercial and military aviation and space programs. Principal products include aircraft wheels, brakes and landing gears; ground and airborne radar systems; flight control systems and hydraulic components; space guidance and communication systems and missile components.
- . Forest Products. Bendix's forest products operations are conducted through a wholly-owned subsidiary, Bendix Forest Products Corporation. The company is primarily engaged in the manufacture and distribution of building materials and other wood and aluminum products for the construction, home remodeling, agricultural and related markets.
- . Industrial Energy. Bendix is an important machine tool supplier, manufacturing automated transfer machines, assembly systems, numerical control systems and precision inspection and measurement equipment. Bendix's energy-related operations are conducted through three subsidiaries:
  - Skagit Corporation, which manufactures mooring and winching equipment for off-shore oil drilling rigs
  - Texas Pipe Bending Company, which is a fabricator of piping systems for various industrial processes
  - United Geophysical Corporation, which conducts geophysical exploration services such as seismic surveys for oil and gas drilling.
- . Automotive. Bendix is an important automotive supplier in the United States and in many foreign countries. Brake systems are the principal passenger car product. The automotive group is organized into six sections. (See Figure 2-1.) Fram Corporation manufactures and markets air, oil and fuel filters. The other five sections

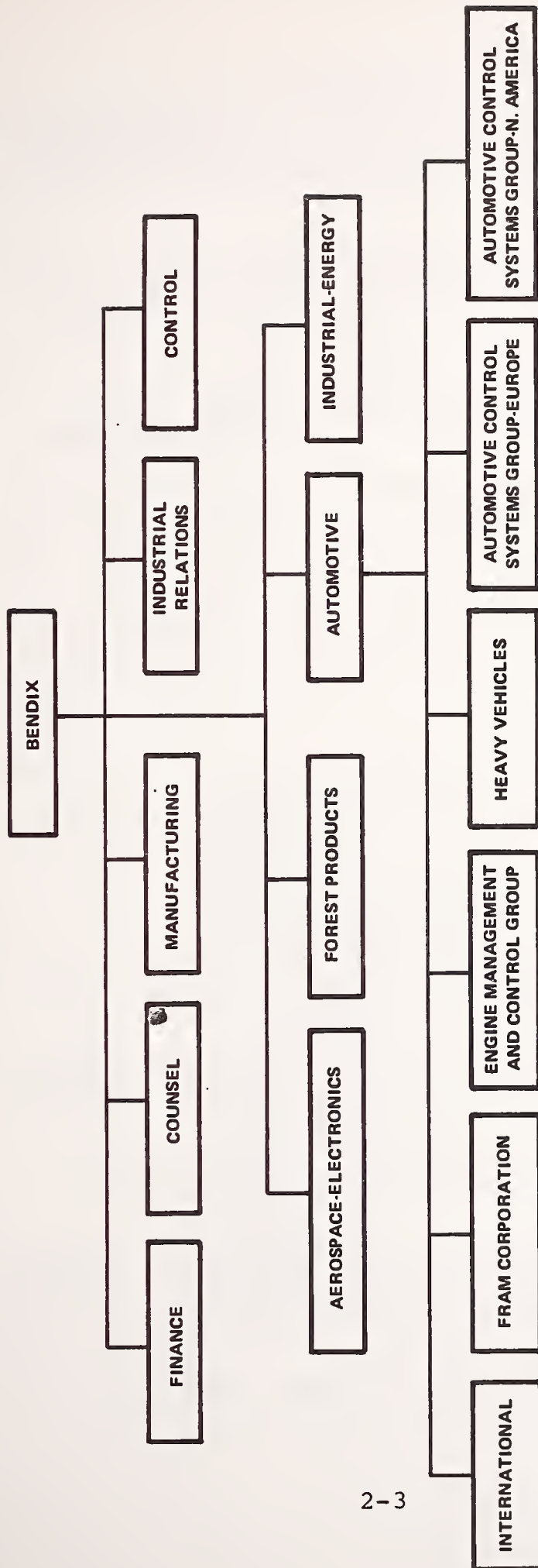


FIGURE 2-1. BENDIX CORPORATE ORGANIZATION

include the Engine Management and Controls Group, the Heavy Vehicles Group, the Automotive Control Systems Group-Europe, the Automotive Control Systems Group-North America and the International Group.

Table 2-2 shows Bendix's sales and profits in each business segment. As can be seen by the table, Bendix's Automotive Group comprises over half of the company.

TABLE 2-2. BENDIX SALES AND PROFITS BY BUSINESS SEGMENT, 1979

| Segment               | Sales % | Operating Profits % |
|-----------------------|---------|---------------------|
| Automotive            | 52      | 50                  |
| Aerospace-Electronics | 28      | 34                  |
| Forest Products       | 12      | 9                   |
| Industrial-Energy     | 9       | 9                   |

## 2.2 MAJOR MARKETS AND PRODUCTS

Figure 2-2 summarizes the major market information for Bendix.

| <u>MARKET DATA</u>                     |  |
|--|--|
| Major Markets:                         | Automotive, airline, space, heavy industry, housing                        |
| Percent of Sales to the Auto Industry: | 30 percent original equipment, 20 percent replacement market               |
| Supplies to:                           | AMC, Chrysler, Ford, GM, Peugeot, Renault, Citroen                         |
| Major Automotive Products:             | Brake systems, steering systems, electronic engine controls, machine tools |

FIGURE 2-2. BENDIX MARKET DATA

2.2.1 Major Markets

Bendix sells to the automotive industry, airline and space industries, heavy industrial companies and the housing market.

The automotive market for Bendix products is quite diversified. (See Figure 2-3.) Automotive sales, which are 52 percent of total sales, are roughly divided into 55 percent domestic and 45 percent overseas sales. Components that are installed on new vehicles represent 60 percent of the automotive total while replacement parts account for roughly 40 percent.

Sales to original equipment manufacturers are made to a relatively small number of customers. For the year ended September 30, 1978, total worldwide sales for original equipment and aftermarket use to American Motors Corporation, Chrysler Corporation, Ford Motor Company, General Motors Corporation, Peugeot, Renault and Citroen amounted to \$966.5 million or 27 percent of total sales. Sales to Ford alone amounted to \$419.1 million or 12 percent of total sales.

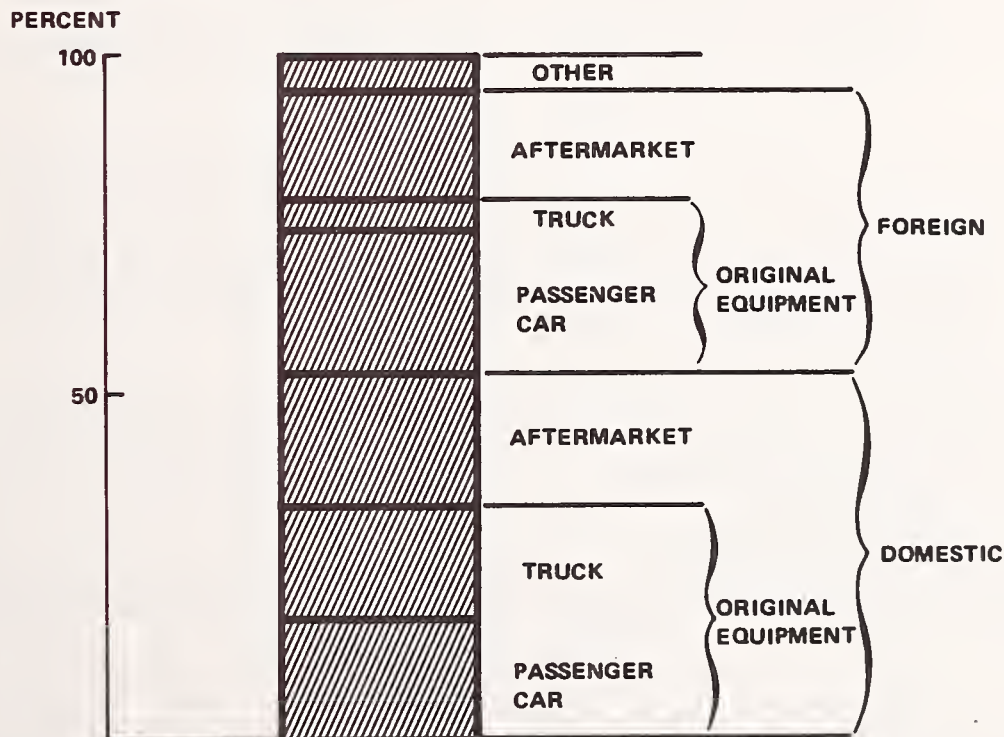


FIGURE 2-3. BREAKDOWN OF BENDIX AUTOMOTIVE REVENUES, FISCAL YEAR 1978

### 2.2.2 Automotive Products

Bendix's principal products for passenger cars and light trucks are brake systems and components, including disc and drum brakes, friction materials, wheel and master cylinders and power brake boosters; steering systems, and a variety of electronic engine controls such as under-the-hood valves.

Bendix Automotive Aftermarket is a supplier of automotive and light truck brake replacement products. Major products include:

- . Disc brake products - Disc pads, rotors, caliper assemblies, hardware and caliper repair kits
- . Hydraulic parts - Wheel cylinders, master cylinders (new and remanufactured), repair kits, hoses and brake fluid
- . Power brake units - Hydrovac, Treadle Vac, Mastervac
- . Drum brake products - New-lined brake shoes, drums, brake cables and hardware
- . Friction materials - Drum, disc and clutch facings.

Fram Corporation, a Bendix subsidiary, manufactures and markets air, oil and fuel filters, windshield wiper blades and engine cooling fans. Autolite, another subsidiary and formerly a part of Ford, manufactures spark plugs. Bendix manufactures air braking systems for heavy trucks and off-road vehicles.

Bendix also sells its machine tool products to the automotive industry. These include transfer lines for high-production machining of automotive components.

### 2.2.3 New Product Plans

Bendix is manufacturing new products in three areas related to the auto industry:

- . Electronic fuel injection
- . Aluminum master cylinders
- . Transfer lines.



### *Electronic Fuel Injection*

Bendix has been a pioneer in electronic fuel injection (EFI) and obtained worldwide patents in 1961 (which expired this year). The company has been increasing its sales of EFI systems to Cadillac over the last few years and expects up to 50 percent of cars in 1985 to have some form of electronic fuel injection.

General Motors recently chose Bendix to supply components for an important new generation of EFI systems for GM's cars of the 80s. Bendix has been awarded a contract to furnish throttle position sensors and manifold absolute pressure sensors for EFI systems in certain 1980 GM cars. Beginning in 1981, Bendix will supply GM with fuel injectors and electronic control subassemblies as well as the sensors.

The new contract with GM is for a system called "throttle body injection" that uses two injectors in the engine throttle body rather than a fuel rail with injectors at each cylinder. The electronic injection and sensing components will be produced by Bendix's Electronics and Engine Control Systems Group at plants in Troy, Michigan, and Newport News, Virginia. Bendix is not expected to receive any royalties from GM on the systems that the automaker produces in-house. As part of the agreement it has reached with GM, Bendix reportedly has given up royalties for a portion of the component business.

### *Aluminum Master Cylinder*

Bendix has recently introduced a new aluminum master cylinder which weighs only 2.8 pounds—5 pounds less than the previous cast iron unit. While aluminum costs more than cast iron, the higher cost of aluminum has been partially offset by increased productivity. The aluminum master cylinders are completely machined on a 24-station palletized transfer system built by Bendix Machine Tool Corporation and manufactured by Bendix Automotive Control Systems Group, South Bend, Indiana. Productivity has been increased several ways, including the incorporation of pressure testing and gauging of bores on-line instead of off-line, as was previously done.

### *Transfer Lines*

Bendix has recently received a considerable amount of publicity in connection with its machine tool sales to the automotive industry. New sales include transfer lines for:

- . Ford transmissions
- . Chevy transmissions

- . Ford V-6 engines
- . Power steering rack pistons.

These are described below.

- . Ford Transmission. Bendix has built a \$10 million transfer line system for Ford that will be used at the automaker's 2.1 million-square-foot Batavia, Ohio, plant to produce transaxles. The transaxles will be used in Ford's new line of subcompact cars to be introduced in 1981 to replace the Pinto and Bobcat models. The machining system is the largest, nonsynchronous, automated assembly system for automatic transmissions in the world. Its 1,500 feet of conveyor will connect a total of 156 assembly, inspection, checking and test stations, arranged to form three oval-shaped sections.
- . Chevy Transmission. In late 1978, Chevrolet awarded Bendix a major contract to furnish a complete, non-synchronous, assembly system for use in production of a new line of fuel-efficient transmissions for light-duty trucks and vans. The transmission will be a rear-wheel-drive unit that will be introduced in late 1980 and installed in Muncie, Indiana. Bendix has already built the transmission assembly system to produce manual four-speed transmissions for GM's front-wheel-drive compact "X" cars. This system was also installed in Muncie.
- . Ford V-6 Engine. Ford has chosen Bendix, Cross and Ex-Cell-O Corporation as the suppliers of a number of transfer machines that will perform the drilling, milling and boring operations on the company's first North American V-6 engines. The machines will be delivered in 1980 to Ford's new Essex plant in Windsor, Ontario. The new engines are expected to be introduced in the fall of 1981 in the company's smaller 1982 model cars. Bendix will construct the drilling equipment for the engine.
- . Power Steering Parts. A major midwestern automotive parts builder has purchased an efficient 46-station transfer line from Bendix to perform multiple machining operations on automobile power steering rack pistons. The line machines two parts at a time in 18 seconds.

#### 2.2.4 Sales Strategy

Bendix is involved in consumer marketing for its filter and spark plug products. Television commercials with a mechanic lamenting, "you can pay me now or pay me later," have become well known. A new campaign has started to broaden the market for Autolite spark plugs which are usually associated with Ford cars. The campaign shows various foreign car owners saying, "It doesn't have to be a Ford to get the most out of Autolite spark plugs."

Bendix has also recently been emphasizing the multi-national aspects of its company. Advertisements have stressed: "We speak automotive—worldwide." A Bendix pamphlet describes the worldwide organization in fourteen languages.

### 2.3 CORPORATE STRATEGY

In the late '60s Bendix established a basic strategy that has been the general guide for the corporation in the '70s and will continue to be followed in the '80s. The basic strategy is diversification. Bendix has established positions in the automotive, aerospace-electronics, forest products and industrial-energy markets, and within these markets the company is further diversified. The recent investment by the company of \$128 million in ASARCO is a dramatic example of Bendix's attempts at diversification. ASARCO is involved with non-renewable resources such as copper, lead, zinc and silver.

Another key business strategy for Bendix is the opening up of new markets while deepening penetration in markets where the company is already established. A key part of this strategy is the use of Bendix's technological strength. The technology base underlies Bendix's ability to gain a competitive edge through more efficient manufacturing techniques. In addition, the company has found its technological strengths in automotive design an asset as auto manufacturers are seeking new ways to lighten vehicles and reduce pollution. Looking to the future, Bendix is spending heavily on electronic controls for both gasoline and diesel engines and on the development of instruments for the new generation of commercial aircraft. It also plans to expand its forest products and industrial-energy businesses.

## 2.4 PRODUCTION AND OPERATIONS

Bendix has facilities throughout the world. In the United States, the company has plants with a total of 24.6 million square feet of floor space. Described below are Bendix's various plants, grouped by geographic location.

### 2.4.1 North American Plants

Bendix has 15 automotive plants in North America. (See Figures 2-4 through 2-14.) These include the following U.S. plants:

- . The Bendix Autolite plant in Fostoria, Ohio, which makes glow plugs and spark plugs and has 1,500 employees
- . The electronic plant in Newport News, Virginia, which makes electronic control devices and has 800 employees
- . The friction materials plant in Green Island, New York, which makes brake linings and clutch facings and employs 775 people
- . The electrical components plant in Sydney, New York, which makes passenger car electrical connectors and has 3,000 employees
- . The brake and steering plant in South Bend, Indiana, which makes power brake systems, power steering systems and constant velocity joints and has 2,590 employees
- . The electronic fuel injection plant in Troy, Michigan, which makes electronic fuel injection systems and has 150 employees
- . The hydraulic plant in St. Joseph, Michigan, which makes brake parts and employs 1,400 people.

In addition to the above plants, Bendix has research facilities in New Carlisle, Indiana, and Southfield, Michigan.

Canadian brake plants are located in Windsor and Walkerville, Ontario. Brake components are also made in Atzacapotzalco, Mexico, and ignition components are made in San Luis Potosi, Mexico.

Company Bendix Corp. County \_\_\_\_\_ Plant Size Unavailable  
 (Bendix Autolite Corp.)

Plant Fostoria Congressional District \_\_\_\_\_

N. Union St. Standard Metropolitan 1,500  
 Fostoria, OH 4830 Statistical Area

Telephone (419) 435-6655 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity                                 | Processes Used | Consumed by (Automotive) |
|-----------------------|--|----------------|--------------------------|
| Spark plugs           | N.C.A.*<br><br>* Not Currently Available | N.C.A.         | N.C.A.                   |

FIGURE 2-4. FOSTORIA PLANT

Company Bendix Corp. County \_\_\_\_\_ Plant Size Unavailable  
 (Electronic & Engine Control System Group)

Plant Newport News Congressional District \_\_\_\_\_

6154 Bland Blvd.  
 Address P.O. Box 2302 Standard Metropolitan 800  
Newport News, VA Statistical Area

Telephone (804) 877-8011 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Air pumps<br>Automatic transmission controls<br>Electronic control devices | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-5. NEWPORT NEWS PLANT

Company Bendix Corp. County \_\_\_\_\_ Plant Size \_\_\_\_\_ Unavailable  
 (Friction Materials Div.)

Plant Green Island Congressional District \_\_\_\_\_

P.O. Box 238  
 Address Tibbits Ave. Standard Metropolitan \_\_\_\_\_ No. of Employees 775  
Green Island, NY Statistical Area

Telephone (518) 273-6550 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                          | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Passenger car brake linings and clutch facings | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-6. GREEN ISLAND PLANT

Company Bendix Corp. County \_\_\_\_\_ Plant Size Unavaillable  
 (Electrical Components Div.)

Plant Sydney Congressional District \_\_\_\_\_

Address Delaware Ave.  
 Sidney, NY 13838 Standard Metropolitan 3,000  
 Statistical Area

Telephone (607) 563-9511 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)               | Capacity | Processes Used | Consumed by (Automotive) |
|-------------------------------------|----------|----------------|--------------------------|
| Passenger car electrical connectors | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-7. SYDNEY PLANT



**Company** Bendix Corp. **County** \_\_\_\_\_ **Plant Size** Unavailable  
 (Automotive Control Systems Group)

**Plant** South Bend **Congressional District** \_\_\_\_\_

401 N. Bendix Drive  
**Address** P.O. Box 4001 **Standard Metropolitan** 2,590  
South Bend, IN 46634 **Statistical Area**

**Telephone** (219) 237-2100 **Primary SIC Code(s)** \_\_\_\_\_

| Products (Automotive)          | Capacity | Processes Used | Consumed by (Automotive) |
|--------------------------------|----------|----------------|--------------------------|
| Passenger car<br>brake systems | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-8. SOUTH BEND PLANT

Company Bendix Corp. County \_\_\_\_\_ Plant Size Unavailable  
 (Electronics & Engine Control Systems Group)

Plant Troy Congressional District \_\_\_\_\_  
 900 West Maple Road  
 Address Troy, MI 48084 Standard Metropolitan 150  
 Statistical Area

Telephone (313) 362-1800 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Passenger car fuel injection components<br>Air pumps<br>Automatic temperature controls<br>Electronic control units<br>Engine sensors | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-9. TROY PLANT

Company Bendix Corp. County \_\_\_\_\_ Plant Size Unavailable  
 (Automotive Control Systems Group)

Plant St. Joseph Congressional District \_\_\_\_\_

Red Arrow Highway  
 Address St. Joseph, MI 49085 Standard Metropolitan 1,400  
 Statistical Area

Telephone (616) GA9-3221 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Passenger car brakes<br>Master cylinders<br>Hydro-boost power<br>brake system<br>Grey iron castings | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-10. ST. JOSEPH PLANT

Company Bendix Corp. County \_\_\_\_\_ Plant Size \_\_\_\_\_ Unavailable

Plant Windsor Congressional District \_\_\_\_\_

Address 945 Prince Road Windsor, ON N8Y4S3 Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 850

Telephone (519) 254-9263 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                | Capacity | Processes Used | Consumed by (Automotive) |
|--------------------------------------|----------|----------------|--------------------------|
| Vacuum power systems (passenger car) | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-11. WINDSOR PLANT

Company Bendix Corp. County \_\_\_\_\_ Plant Size Unavailable

Plant Walkersville Congressional District \_\_\_\_\_  
 Address P.O. Box 2400  
1473 Argyle Road  
Walkersville, ON No. of Employees 700  
NBY4S3

Telephone (519) 254-9253 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Passenger car drum<br>brakes<br>Brake shoes<br>Hydraulic cylinders | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-12. WALKERSVILLE PLANT

Company Bendix County \_\_\_\_\_ Plant Size \_\_\_\_\_  
Frenomex

Plant Atzcapotzalco Congressional District \_\_\_\_\_

Avenida de las Granjas 473-A  
Atzcapotzalco, Mexico 16, D.F.  
 Address \_\_\_\_\_ No. of Employees \_\_\_\_\_  
Standard Metropolitan  
Statistical Area

Telephone 561-00-33 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Brake components      | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-13. ATZCAPOTZALCO PLANT

Company Bendix County \_\_\_\_\_ Plant Size \_\_\_\_\_

Bendix Mexicana, S.A.

Plant San Luis Potosi Congressional District \_\_\_\_\_

Address Zona Industrial  
San Luis Potosi  
S.L.P., Mexico

Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees \_\_\_\_\_

Telephone 2-90-99 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Ignition components   | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-14. SAN LUIS POTOSI PLANT

#### 2.4.2 European Plants

Bendix has seven automotive plants in Europe. These plants, which supply for the most part automakers within Europe, are listed below. (See Figures 2-15 through 2-21.)

- . Benditalia in Crema, Italy, makes master cylinders, wheel cylinders, controls and other brake parts.
- . Deutsche Bendix in Ferdinand-Porsche-Strasse, West Germany, makes disc brakes and vacuum power brakes.
- . Textar in Leverkusen, West Germany, makes brake linings and clutch facings, as does Jurid Werke in Gliese bei Hamburg.
- . Bendiberica in Barcelona, Spain, makes power steering and brake parts.
- . Bendix Westinghouse in Bristol, England, makes clutch controls, compressors and truck air brake systems.
- . Societe Anonyme D.B.A. in Clichy, France, makes automotive electrical equipment, batteries, filters, steering systems and brake systems.

#### 2.4.3 Other Plants

In South America, Bendix has three brake plants. These are located in Caracas, Venezuela; Buenos Aires, Argentina; and Campinas, S.P., Brazil. In Australia, Bendix has a plant in Ballarat, Victoria, which makes brake parts and one in Rockdale, New South Wales, which makes filters, pumps and power steering systems. There are two Bendix plants in Tokyo which make brake and power steering systems. (See Figures 2-22 through 2-28.)

#### 2.4.4 New Plants and Expansions

Recent or planned expansions at Bendix include the following:

- . A \$16.5 million ductile iron foundry in Farnham, Quebec, a joint venture that will provide Bendix with 20,000 tons of iron castings annually



Company Bendix County Benditalia Plant Size \_\_\_\_\_  
Benditalia

Plant Crema Congressional District \_\_\_\_\_

Via Cavalli 53/A  
 Address 26013 Crema, Italy Standard Metropolitan Statistical Area No. of Employees \_\_\_\_\_

Telephone (0373) 81444 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                           | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Master cylinders<br>Wheel cylinders<br>Controls | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-15. CREME PLANT

Company Deutsche Bendix County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Ferdinand-Porsche-Strasse  
Congressional District \_\_\_\_\_

Address 6600 Saarbrucken  
Postfach 1309  
Ferdinand-Porsche-  
Strasse  
West Germany

Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
Statistical Area

Telephone (0681) 5910 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)              | Capacity | Processes Used | Consumed by (Automotive) |
|------------------------------------|----------|----------------|--------------------------|
| Disc brakes<br>Vacuum power brakes | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-16. FERDINAND-PORSCH-STRASSE PLANT

Company Bendix County \_\_\_\_\_ Plant Size \_\_\_\_\_  
Textar

Plant Leverkusen Congressional District \_\_\_\_\_

Address Postfach 544 Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
509 Leverkusen- Statistical Area  
Schlebusch  
West Germany

Telephone (02172) 3591 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)           | Capacity | Processes Used | Consumed by (Automotive) |
|---------------------------------|----------|----------------|--------------------------|
| Brake linings<br>Clutch facings | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-17. LEVERKUSIN PLANT

Company Bendix County \_\_\_\_\_ Plant Size \_\_\_\_\_  
Jurid Werke

Plant Glinde bei Hamburg Congressional District \_\_\_\_\_

2057 Reinbek  
 Postfach 6  
 Hamburg, West Germany  
 Address \_\_\_\_\_ Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
 Statistical Area

Telephone (0411) 72711 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)           | Capacity | Processes Used | Consumed by (Automotive) |
|---------------------------------|----------|----------------|--------------------------|
| Brake linings<br>Clutch facings | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-18. GLINDE BEI HAMBURG PLANT

Company Bendix County \_\_\_\_\_ Plant Size \_\_\_\_\_  
Bendiberica

Plant Barcelona Congressional District \_\_\_\_\_

Avenida Guipuzcoa 42, bis  
Address Pamplona, Spain Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
Statistical Area

Mailing Address: Balmes 243, ALICO  
Barcelona 6, Spain

Telephone 228-61-07 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)               | Capacity | Processes Used | Consumed by (Automotive) |
|-------------------------------------|----------|----------------|--------------------------|
| Power steering parts<br>Brake parts | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-19. BARCELONA PLANT

Company Bendix Westinghouse County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Bristol Congressional District \_\_\_\_\_

Address Douglas Road Kingswood Bristol, BS15 2NL England Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees \_\_\_\_\_

Telephone (0272) 671881 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                                     | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Clutch controls<br>Compressors<br>Truck air brake systems | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-20. BRISTOL PLANT

Company Bendix County \_\_\_\_\_ Plant Size \_\_\_\_\_  
 Societe Anonyme D.B.A.

Plant Clichy Congressional District \_\_\_\_\_

98, Boulevard Victor Hugo  
 Address 92115 Clichy, France Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
 Statistical Area

Telephone 739-9080 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Automotive electrical<br>equipment<br>Batteries<br>Filters<br>Steering systems<br>Brake systems | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-21. CLICHY PLANT

Company Bendix-Miranda C.R.L. County Caracas Plant Size \_\_\_\_\_

Plant Caracas Congressional District \_\_\_\_\_  
 Address Edificio Roche  
Ave. Principal Los Ruices  
Caracas, 106, Venezuela Standard Metropolitan \_\_\_\_\_  
 Statistical Area \_\_\_\_\_  
 No. of Employees \_\_\_\_\_

Mailing Address: Apartado Postal 62349  
Caracas, 106, Venezuela  
 Telephone 346523 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                                     | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Passenger car and truck<br>drum brakes<br>Wheel cylinders | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-22. CARACAS PLANT



Company Industrias Bendix County                      Plant Size                       
S.A.I.CigF.

Plant Buenos Aires Congressional District                     

Maria de Montes de Oca 6430  
 Munro F.C.G.B.

Address Pcia, de Buenos Aires Standard Metropolitan                      No. of Employees                       
Statistical Area

Mailing Address: Casilla de Correo 1881  
 Correo Central  
 Buenos Aires, Argentina

Telephone 762-3311 Primary SIC Code(s)                     

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Master cylinders<br>Drum brakes<br>Power brakes<br>Disc brakes | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-23. BUENOS AIRES PLANT

Bendix Do Brasil  
Equipamentos  
Para Autoveiculos  
LTDA

**Company** \_\_\_\_\_ **County** \_\_\_\_\_ **Plant Size** \_\_\_\_\_

**Plant** Campinas **Congressional District** \_\_\_\_\_

Rua Joao Felipe Xavier de Silva, 384  
**Address** Campinas, S.P. **Standard Metropolitan** \_\_\_\_\_ **No. of Employees** \_\_\_\_\_  
Statistical Area  
Mailing Address: Caixa Postal 1122  
13,100 Campinas, S.P., Brazil

**Telephone** 2-1061 **Primary SIC Code(s)** \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Master cylinders<br>Disc brakes<br>Drum brakes<br>Power brakes | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-24. CAMPINAS PLANT

Bendix Mintex Pty., Limited

Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Ballarat Congressional District \_\_\_\_\_

Address P.O. Box 631  
Ballarat, Victoria Standard Metropolitan No. of Employees \_\_\_\_\_  
3350 Australia Statistical Area

Telephone 35-8211 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Clutch facings<br>Drum brake linings<br>Caliper disc brake pads | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-25. BALLARAT PLANT

The Bendix Corporation  
 Australia PTY., Limited  
 Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant \_\_\_\_\_ Rockdale \_\_\_\_\_ Congressional District \_\_\_\_\_  
 435-445 West Botany St.  
 P.O. Box 19  
 Rockdale, N.S.W.  
 Address \_\_\_\_\_ Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
 Statistical Area \_\_\_\_\_

Telephone \_\_\_\_\_ 587-7222 \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Filters<br>Fuel pumps<br>Integral power steering<br>Carburetors | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-26. ROCKDALE PLANT

Akebono Brake Industry

Company Co., Ltd. County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Tokyo (1) Congressional District \_\_\_\_\_

2-3 Nikonbashi Koami-cho

1-Chome, Chuo-Ku

Tokyo, Japan 103

Address \_\_\_\_\_ Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
 Statistical Area \_\_\_\_\_

Telephone (03) 668-5171 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Clutch facings<br>Disc brake lining pads<br>Drum brake lining segments<br>Disc brakes<br>Drum brakes | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-27. TOKYO (1) PLANT

Jidosha Kiki  
 Company Kabushiki Kaisha County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Tokyo (2) Congressional District \_\_\_\_\_

Minami Shinjuku Building  
 10, Yoyogi 2-Chome  
 Address Shibuya-Ku No. of Employees \_\_\_\_\_  
 Tokyo, Japan Standard Metropolitan  
 Statistical Area

Telephone 379-2211 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                 | Capacity | Processes Used | Consumed by (Automotive) |
|---------------------------------------|----------|----------------|--------------------------|
| Power steering<br>Vacuum power brakes | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 2-28. TOKYO (2) PLANT

- . A \$16 million expansion of the Bendix do Brasil brake products plant, increasing capacity by 38 percent
- . A \$10 million expansion of the Autolite spark plug plant in Fostoria, Ohio, to increase production capacity by 20 percent
- . A \$7.5 million capital outlay for equipment to produce fuel injectors for auto engines at Newport News, Virginia
- . A \$3.5 million manufacturing plant in Charlotte, North Carolina.

## 2.5 FINANCIAL STATUS

Bendix has had a sound, steady performance over the last five years.

### 2.5.1 Operations Analysis

Bendix contends that its policy of diversification has shielded it from the extremes of the business cycle. The company's operating results over the last five years support this idea. Operating income as a percentage of sales has been very steady, and sales as a percentage of assets have increased. Thus, return on equity has shown a rise in recent years. (See Figure 2-29.)

Bendix had an excellent showing throughout fiscal 1979 (October 1978-September 1979). The company benefited in the beginning of the period from strong demand in the automotive and lumber industries, while earnings from Asarco, Inc., helped end-of-year performance. For the fiscal year, net income gained 25 percent on a 6 percent rise in sales.

Bendix's automotive group had a decrease in operating profit in 1974 and 1975 with an increase in the last four years. In 1978 operating profits increased about 2 percent as North American profits offset declining profits overseas due to operating losses at Bendix's largest foreign subsidiary, DBA. Automotive profits increased about 1 percent in 1979.

| Year* | Sales<br>(\$Millions) | Earnings<br>(\$Millions) | Return on<br>Equity, Percent | Operating Income**<br>Sales | Percent |
|-------|-----------------------|--------------------------|------------------------------|-----------------------------|---------|
| 79    | 3829                  | 163                      | 16.7                         | 9.1                         |         |
| 78    | 3626                  | 130                      | 14.6                         | 9.3                         |         |
| 77    | 3283                  | 118                      | 15.0                         | 8.6                         |         |
| 76    | 2947                  | 105                      | 13.9                         | 9.1                         |         |
| 75    | 2590                  | 80                       | 13.0                         | 8.6                         |         |
| 74    | 2464                  | 76                       | 13.7                         | 9.1                         |         |

\*Ending Sept. 30.

| Year | Earnings<br>Total Assets | Percent | Sales<br>Assets | Earnings<br>Sales | Percent |
|------|--------------------------|---------|-----------------|-------------------|---------|
| 79   | 7.5                      |         | 1.79            | 4.2               |         |
| 78   | 6.6                      |         | 1.83            | 3.6               |         |
| 77   | 6.7                      |         | 1.86            | 3.6               |         |
| 76   | 5.8                      |         | 1.61            | 3.6               |         |
| 75   | 5.0                      |         | 1.61            | 3.1               |         |
| 74   | 5.0                      |         | 1.61            | 3.1               |         |

\*\*Operating Income = Sales - Cost of Goods Sold - Selling, General and Administrative Expenses, Before Depreciation, Interest, and Income Taxes.

FIGURE 2-29. BENDIX  
OPERATIONS ANALYSIS



### 2.5.2 Capital Analysis

Bendix has had some changes in its equity accounts over the last five years, but these have primarily been due to acquisitions and divestitures. Long-term debt has increased moderately over the past five years, and the ratio of debt to capitalization has been steady and well within Bendix's internally established limit. (See Figure 2-30.)

Capital expenditures have increased significantly in the last few years. In addition, Bendix continues to invest in new companies, such as the recent purchase of two building materials businesses for \$55 million and the acquisition of Warner and Swasey. Thus, periodic borrowing in the next few years can be expected. However, Bendix's financial condition appears quite sound, and obtaining capital should not be an obstacle to further growth.

### 2.6 RESEARCH AND DEVELOPMENT

Research and development is considered an important part of Bendix's activities. Work is done for the most part at research laboratories in Southfield, Michigan. Bendix spent about \$60 million in 1979 for automotive engineering. Some current research done by the company is listed below.

- . The company has designed a lightweight spindle out of steel instead of nodular iron. The component is structurally sound and less costly than previous models.
- . Research is taking place on electronic controls of automatic transmissions. Bendix points out that electronics may allow a simpler mechanical design for transmissions.
- . New sensors with greater durability are being developed, and attempts are being made to reduce manufacturing costs.

## Sources

| Year * | Sources |                        |          |              |                           |  |
|--------|---------|------------------------|----------|--------------|---------------------------|--|
|        | Sales   | P/E Ratio <sup>1</sup> | Earnings | Depreciation | Changes in Long-Term Debt | Changes in Owners' Equity Other Than Retained Earnings |
| 79     | 3829    | 6.0-5.0                | 163      | 73.3         | 47                        | 1.0  |
| 78     | 3626    | 7.5-5.6                | 130      | 71.5         | 93                        | 13.4   |
| 77     | 3283    | 8.9-6.5                | 118      | 63.1         | (23)                      | 4.8  |
| 76     | 2947    | 9.8-7.0                | 105      | 57.3         | (13)                      | (40.4)   |
| 75     | 2590    | 9.3-4.5                | 80       | 51.9         | 51                        | 1.0  |
| 74     | 2464    | 6.5-4.3                | 76       | 53.8         | (14)                      | (0.6)  |

## Uses

| Year * | Uses                      |                      |           | Long-Term Debt <sup>2</sup><br>Capitalization % | Coverage <sup>3</sup> | Cap. Exp.<br>Total Assets % | Current<br>Ratio |
|--------|---------------------------|----------------------|-----------|---|-----------------------|-----------------------------|------------------|
|        | Change in Working Capital | Capital Expenditures | Dividends |   |                       |                             |                  |
| 79     | 45                        | 132                  | 57.9      | 26.7  | 6.1                   | 6.1                         | 1.6              |
| 78     | 0                         | 158                  | 50.8      | 26.3  | 6.4                   | 8.2                         | 1.7              |
| 77     | (8.8)                     | 139                  | 44.0      | 21.7  | 4.5                   | 8.0                         | 1.8              |
| 76     | 0                         | 93                   | 36.2      | 25.0  | 6.8                   | 5.8                         | 1.9              |
| 75     | 91.7                      | 68                   | 30.9      | 26.9  | 5.2                   | 4.3                         | 2.0              |
| 74     | (4.4)                     | 76                   | 29.5      | 23.5  | 5.0                   | 5.1                         | 1.7              |

Dollar figures are in millions

\* Ending September 30.

<sup>1</sup> Range for the year<sup>2</sup> Capitalization Defined as Total Liabilities - Current Liabilities<sup>3</sup> Operating Profit/Interest

- . Bendix has researched the use of graphite for automobile parts. A brake pedal assembly of graphite/epoxy has been designed that has the potential for high-volume production.
- . Research is continuing on emissions and electronic fuel injection.

## 2.7 GOVERNMENT RELATIONS

William M. Agee, chairman and chief executive officer of Bendix, has spoken about the role business must play in politics. He has asked people throughout the business world to more effectively explain their views to the country and increase their input into the political process. He has called for stimulation of savings and investment to encourage technical innovation, and an increase in leadership from the Federal Government.

Bendix Corporation announced at the beginning of 1980 that an agreement had been reached with the Federal Trade Commission permitting it to acquire Warner & Swasey, Inc. Under the terms of the agreement, Bendix and its Warner & Swasey, Inc., subsidiary each will have to sell some of their machine-tool businesses. Bendix acquired Warner & Swasey for more than \$300 million. The Federal Trade Commission (FTC) complained that the merger eliminated competition between the two companies in the production of two types of machine tools: rotating tool holders and external cylindrical grinding machines. The FTC also charged that the merger would endanger competition in the supplying of computerized controls for machine tools.

## 2.8 LABOR RELATIONS

Bendix has a strong conviction that people are the key to maintaining a record of profit improvement and growth. The company has programs for equal opportunity and management development. Under Bendix's Graduate Development Program a group of men and women with high potential are selected each year as professional and managerial candidates whose capabilities are to be developed in a relatively short period of time. Continuing efforts are also being made to identify and develop other promising employees to ensure that capable executives will be available to provide future leadership for the company.



### 3. BORG-WARNER

Borg-Warner today is quite diversified. Its Transportation Equipment group is a major part of the company and one whose sales are heavily dependent on automotive manufacturers. The group by itself would represent a company with sales over \$800 million and rank in the top 300 of the Fortune 500. The Transportation Equipment group has developed many new drive train components for smaller cars and is expecting a strong sales boost in front-wheel-drive components. In addition, the company feels that the new emphasis on innovation in the auto industry will give Borg-Warner an edge over competitors with less experience and poorer capabilities in design and research. Borg-Warner is also investing in a new transmission that may significantly improve fuel economy.

#### 3.1 CORPORATE SIZE AND STRUCTURE

Borg-Warner is a company of over 50,000 persons working in 20 different countries. It is one of the largest producers of automotive parts in the country.

##### 3.1.1 Revenue, Profit and Employment Statistics

Sales of Borg-Warner in 1979 were \$2.7 billion, a 17 percent increase over 1978. Earnings rose to \$156 million, 16 percent higher than the \$134 million reported last year. The firm employed about 54,000 people in 1979 (see Table 3-1).

TABLE 3-1. BORG-WARNER CORPORATION  
REVENUES, PROFIT AND EMPLOYMENT

| Year                         | Revenues (Millions) | Profits (Millions) |
|------------------------------|---------------------|--------------------|
| 1979                         | \$2,700             | \$156              |
| 1978                         | 2,326               | 133                |
| Average Number of Employees: |                     | 54,800 (1979)      |

### 3.1.2 Corporate Organization

Borg-Warner has 50 major divisions with operations in 20 countries on six continents. These operating units are organized into five product and service groups based on similarity of products or technology and not necessarily the markets served. The five groups (see Figure 3-1) include:

- . Air Conditioning. The York division is a major manufacturer of engineered air conditioning systems for large buildings, and industrial refrigeration equipment for the petrochemical, food and other process industries. It also produces commercial air conditioning equipment for smaller office buildings, schools, hotels, factories, and apartment buildings. A growing part of York's business is in central residential air conditioning systems. In addition, it manufactures residential furnaces and automotive air conditioning compressors.
- . Chemicals and Plastics. Cycolac brand ABS is the trade name for a wide range of tough, engineering thermoplastics produced and marketed around the world by Borg-Warner Chemicals. The group also manufactures and markets a full line of Blendex impact modifiers used for upgrading the physical properties and processing characteristics of PVC and other plastics. Borg-Warner Chemicals also is in the fine chemicals business with a growing line of intermediates, additives and alkylphenols.
- . Financial and Protective Services. Borg-Warner Acceptance Corporation is this group's major services unit. It offers these financial services: wholesale, retail and receivables financing; personal loans; credit life, disability and property insurance; and vehicle and equipment leasing. In 1978 Borg-Warner acquired Baker Industries which provides protective services and includes the well-known Wells Fargo Protective Services Unit.
- . Industrial Products. This is the most diversified of the five product and service areas. Major products of this group are centrifugal pumps for power plants, pipelines and water plants; submersible oil well pumps; precision seals for pumps and compressors; valves; chains, bearings and

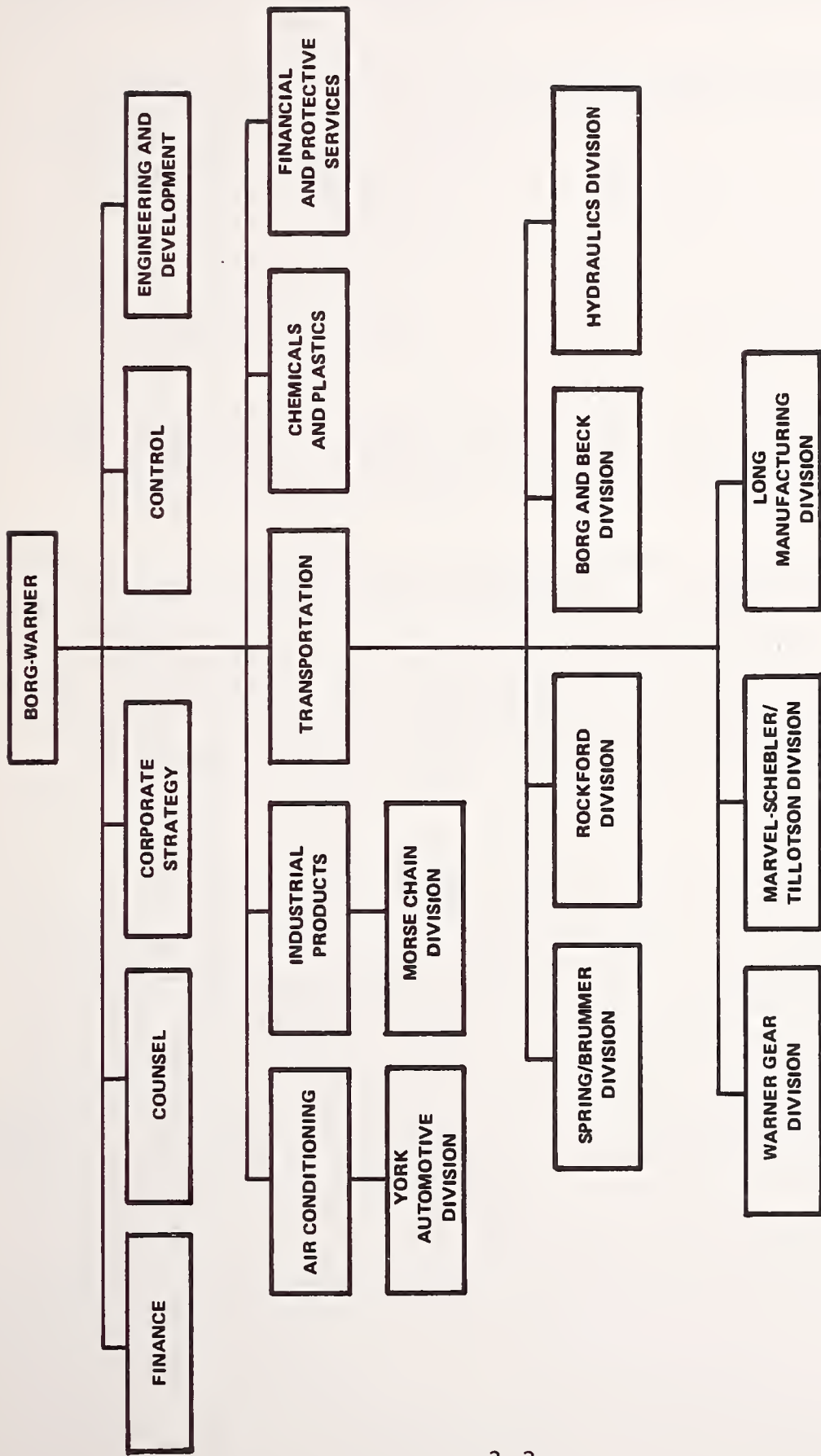


FIGURE 3-1. BORG-WARNER CORPORATE ORGANIZATION

power transmission products. Other products include agricultural discs, hospital furniture, and audio-visual educational systems. The Morse Chain Division sells a considerable amount of timing chains to the automotive industry.

- Transportation Equipment. Borg-Warner is the leading independent producer of automatic transmissions and supplies them to major car and light truck manufacturers. The company's five-speed manual transmission with overdrive was the first such transmission mass-produced in the U.S. In addition to transmissions, other components include clutches, four-wheel-drive units, spin-resistant differentials, axle assemblies, propeller shafts, carburetion and ignition equipment, radiators and other heat exchanges. A broad range of other equipment comes from Borg-Warner, including clutches, four-wheel-drive units, radiators, and replacement parts in passenger cars, trucks, off-highway and farm equipment, boats, aircraft, recreational vehicles and industrial machines.

This last group, Transportation Equipment group, is the most important group in Borg-Warner for the auto industry. It is also the largest group by sales and profits. (See Table 3-2.) Some of the divisions of the Transportation Equipment group are probably more familiar to people in the auto industry than other parts of the corporation. Below are listed some of the most important Borg-Warner transportation divisions and the products they make (see Figure 3-1).

TABLE 3-2. DISTRIBUTION OF SALES AND PROFITS BY PRODUCT GROUP\*

| Product Group                     | Sales | Profits |
|-----------------------------------|-------|---------|
| Transportation equipment          | 37%   | 32%     |
| Air conditioning                  | 22    | 15      |
| Industrial products               | 20    | 26      |
| Chemicals and plastics            | 20    | 14      |
| Financial and protective services | —     | 13      |

\* Based on available 1978 statistics.



- . Rockford Division—Clutches, fan drive systems, power takeoffs, torque converters, universal joints, axle and transmission yokes, brake flanges, drive lines, and driveshafts.
- . Marvel-Schebler/Tillotson Division—Carburetors, engine controls, fuel pumps, emission controls and ignition components.
- . Hydraulic Division—Gear pumps, gear motors, radial piston motors, torque motors, directional control valves, and power steering pumps.
- . Borg and Beck Division—Automatic slack adjusters, clutches, torsional couplings, and torque converters.
- . Spring/Brummer Division—Clutches, clutch plates, transmission brake bands, cushion springs, water pump and oil seals, precision moldings and stampings, and Belleville springs.
- . Long Manufacturing Division—Heavy-duty radiators, heat exchangers, heater cores, oil coolers, condenser and evaporator coils, and EGR coolers.
- . Warner Gear Division—Manual and automatic transmissions, four-wheel-drive systems, standard and spin-resistant differentials, agricultural gear boxes, ring and pinion gears, rear axle assemblies, and hydrostatic wheel drive system.
- . Morse Chain Division—Chain drives, speed reducers and rod ends, timing chain and sprockets, cam clutches and torque limiters, timing belts, motor speed controls, and shaft couplings.
- . York Automotive Division—Vane rotary and conventional reciprocating air conditioner compressors.

This report is devoted largely to the Transportation Equipment group of Borg-Warner. The company's Chemicals and Plastics Group was covered in an earlier quarterly report on the plastics industry.

### 3.2 MAJOR MARKETS AND PRODUCTS

Borg-Warner's major markets and products are outlined below and summarized in Figure 3-2.

MARKET DATA

Major Markets: Automotive, construction, consumer products, agribusiness, machinery

Percent of Sales to the Auto Industry: 24 percent automotive (components for new cars), 19 percent miscellaneous transportation (replacement parts, truck, off-highway and marine parts)

Supplies to the Following Auto Companies: Ford, American Motors, General Motors, Chrysler

Major Transportation Equipment Group Products: Transmissions, drive train components and universal joints, gears and sprockets, water, fuel and oil pumps, motor mounts, ignition components, clutches, torque converters, dampers and brake controls.

FIGURE 3-2. BORG-WARNER MARKET DATA

Total Borg-Warner sales to the automotive industry comprise 23.8 percent of total company sales (see Table 3-3). About 16 percent of this is from the Transportation Equipment group, 4 percent from the Air Conditioning group and 3 percent from the Chemicals and Plastics group.

TABLE 3-3. DISTRIBUTION OF BORG-WARNER SALES BY MARKET\*

| Market  | \$ Million | Percent |
|---|------------|---------|
| Automobiles                                       | 553        | 23.8    |
| Energy and Petrochemicals                         | 269        | 11.6    |
| Trucks and Off-Highway Vehicles                   | 269        | 11.6    |
| Consumer Products                                 | 193        | 8.3     |
| Construction                                      | 186        | 8.0     |
| Housing   | 179        | 7.7     |
| Replacement Parts                                 | 154        | 6.6     |
| Machinery   | 135        | 5.8     |
| Agribusiness (farm equipment and food processing) | 123        | 5.3     |
| Government Defense and Aerospace                  | 51         | 2.2     |

\*Based on available 1978 data.

Table 3-4 shows the sales distribution of the Transportation Equipment group by market. The most important markets are automobiles, replacement parts, off-highway equipment and trucks. A large part of the automotive and off-highway equipment markets is overseas.

TABLE 3-4. SALES OF THE TRANSPORTATION EQUIPMENT GROUP OF BORG-WARNER BY MARKET, 1978

| Market                              | U.S. and Non-U.S. Sales (\$ Millions) | % of Total Group Sales | % of Non-U.S. Sales in Each Category |
|-------------------------------------|---------------------------------------|------------------------|--------------------------------------|
| Automobiles                         | 362                                   | 42                     | 51                                   |
| Replacement Parts                   | 142                                   | 16                     | 11                                   |
| Off-Highway Equipment               | 127                                   | 15                     | 30                                   |
| Trucks                              | 107                                   | 12                     | 5                                    |
| Agribusiness-Agricultural Equipment | 58                                    | 7                      | 21                                   |
| Machinery                           | 20                                    | 2                      | 30                                   |
| Recreational Vehicles               | 17                                    | 2                      | 6                                    |
| Government and Defense              | 6                                     | 1                      | 0                                    |
| Aerospace                           | 6                                     | 1                      | 17                                   |
| Marine                              | 5                                     | 1                      | 100                                  |
| Other                               | 13                                    | 2                      | 31                                   |
| Total                               | 863                                   | 100                    | —                                    |

Borg-Warner's transportation products are sold largely to original equipment manufacturers. Replacement parts are also sold through company-owned distribution centers to independent warehouse distributors and remanufacturers. The three largest U.S. automotive manufacturers accounted for approximately 41 percent of the Transportation Equipment group's sales in 1978. The transportation equipment market is highly competitive, and a portion of the competition comes directly from the automobile manufacturers.

Sales outside the United States are made directly to original equipment manufacturers. Approximately 39 percent of the total sales of the Transportation Equipment group for 1978 was derived from sales outside the United States, including exports.

### 3.2.1 Major Automotive Products

Borg-Warner believes it is one of the major independent suppliers of manual transmissions for cars and trucks in the United States and of automatic transmissions of cars manufactured in other countries. Sales of such transmissions,

Borg-Warner also has an automotive parts operation that is responsible for making available to the replacement market every automotive part that Borg-Warner makes. The line of 15,000 different "part numbers" maintained in seven regional distribution centers includes major Borg-Warner specialties like clutches, along with ignition kits, carburetor kits, fuel pumps, emission control devices, gears, timing chains and many other items that might be needed.

#### *New Product Plans*

Two new Borg-Warner products have recently received considerable publicity: energy-saving motor controls and a variable speed transmission.

- . Motor Controls. While these products are not directly related to the automobile, they are likely to have a significant impact on Borg-Warner. In October 1979, Borg-Warner announced it would introduce a line of microcomputer-controlled variable speed motor drives that can reduce energy usage by up to 30 percent on items such as centrifugal chillers on air conditioners. In addition, Morse Chain division of Borg-Warner will market a new line of microcomputer-controlled AC inverters. These parts can be employed on industrial fan pump and blower motors to realize up to a 30 percent energy savings. Both new products were made possible by the compact and comparatively low-cost solid state power electronics and microprocessor components now available.
  
- . Transmission. Borg-Warner Corporation and Fiat of Italy announced in early 1979 that they planned to acquire 48 percent interest in a Dutch company that is developing an improved continuously variable transmission for automobiles. The developer of the transmission is Van Doorne Transmissie, B.V., of Holland. According to Borg-Warner, the unit could reduce automotive fuel consumption by 14 to 20 percent by permitting the engine to operate at the most efficient level required to supply any combination of vehicle speed and power. The variable transmission, which permits a continuous rather than discrete variation in gear ratios, is adaptable to front-wheel-drive cars with either transverse mounted or in-line mounted engines. It can also be used with the basic rear-wheel-drive cars and has apparent applications outside of the automotive market.

both manual and automatic, accounted for approximately 40 percent of the transportation group's total sales in 1978. Transmissions are predominantly sold to original equipment manufacturers.

Changes in the automobile due to downsizing and other regulations have impacted many of Borg-Warner's automotive products. Some of the changes are described below.

- . Transmissions. Borg-Warner has designed and manufactured new transmissions that feature "lock-up" torque converters. These systems avoid the fluid slippage in regular torque converters and improve fuel economy up to 7 percent.
- . Fans. Borg-Warner has developed a device that controls the speed of fans in trucks. Sensors read the temperature of the engine's coolant and turn on the fan only when it is needed. Thus, a significant fuel saving, perhaps 4 or 5 percent, is possible.
- . Front-Wheel Drive. Borg-Warner is designing new front-wheel-drive components. The company's HY-VO chain, which is strong, light, flexible, and can transfer energy at high velocity and very quietly, has already replaced gears in some large cars that use front-wheel drive.
- . Compressors. Borg-Warner has introduced a new rotary automotive air conditioner compressor that reduces noise and vibration. The unit takes up 20 percent less space in a configuration that fits better into smaller engine compartments while still offering larger cooling capacity than previous designs.
- . EGR Valves. Recent pollution legislation has led to exhaust gas recirculation (EGR) systems on cars. Borg-Warner now produces EGR valves as well as other control devices, switches and solenoids related to pollution control.
- . Transfer Cases. The boom in sales for four-wheel-drive utility vehicles in the last decade has helped Borg-Warner. The company makes transfer cases for both "full-time" four-wheel-drive systems—in which power is fed continuously to both axles to drive all four wheels—and for "part-time" systems in which one pair of wheels can be engaged as driving conditions require.

## *Sales Strategy*

Borg-Warner has launched a new corporate advertising campaign which features Borg-Warner as an innovative company actively involved in eight major markets, including automotive, consumer products, energy, construction, agribusiness, machinery, financial and protective services. The advertisements are targeted at decision makers in the investment community, customers, prospective customers, shareholders and employees. The print campaign began in late 1979 and is running nationally in the Wall Street Journal, New York Times, Business Week, Forbes, Fortune and other selected publications. These advertisements will be supplemented by the television commercials that will appear in New York and Chicago areas. Television ads began New Year's Day during the major football bowl games.

While the corporate ads are geared toward raising general awareness of Borg-Warner, particularly within the investment community, the Borg-Warner divisions promote their various products independently. The Transportation Equipment group is attempting to create more awareness of the group structure because its officials feel that buyers' time is limited. If buyers can make one contact with one source (at group level) rather than having to deal with representatives from each division, more effective selling can occur. This parallels a Transportation Equipment group move into a systems concept for its products where, for example, a Warner Gear division transmission is sold with a Borg and Beck division clutch.

### 3.3 CORPORATE STRATEGY

In 1976, Borg-Warner established a strategic planning system. According to the company, capital expenditure decisions had previously been made with only limited attention to the overall direction and position of the corporation. In the early '70s, Warner Gear Division lost a major customer and was forced into a reappraisal of its way of doing business. By 1974, the division had adopted a promising new technique for grading and managing its products. Top management observed this and examined the whole field of strategic planning emerging from leading business schools, consulting firms and progressive companies. A long-range planning procedure was established for the company and a new five-year goal was made—to exceed the median return on equity for Fortune 500 companies by 1980. This would be accomplished by:

- . Sharpening the efficiency of present operations

- . Changing the business mix by preferentially growing the more profitable segments of present businesses and by acquisitions in areas of greater promise.

One of Borg-Warner's major strategies has been to increase its participation in the service sector of the economy as a means of reducing the impact of economic cycles on its performance. Since 1968, the contribution to earnings of Borg-Warner's service businesses has grown from 3 percent to 13.5 percent. The recent acquisition of Baker has aided this trend. Borg-Warner's long-term objective is to derive about one-third of total company earnings from service operations.

### 3.4 PRODUCTION AND OPERATIONS

Borg-Warner operates more than 93 manufacturing facilities in the United States and 15 other countries on six continents.

#### 3.4.1 North American Plants

Listed below are the major automotive-product plants in North America. (See Figures 3-3 through 3-18.)

- . Sterling Heights Plant. The Sterling Heights plant is part of the Borg and Beck Division and manufactures torque convertors and clutches. The plant, in Sterling Heights, Michigan, covers 293,000 square feet and employs 728 people.
- . Chicago Plant. The Chicago plant is also part of the Borg and Beck Division and manufactures automatic slack adjusters, torsional couplings, clutches and torque converters. The plant covers 284,250 square feet and employs 600 people.
- . Coldwater Plant. The Coldwater plant is part of the Long Manufacturing Division and is located in Coldwater, Michigan. The plant, which has 52,000 square feet and employs 95 people, makes heavy-duty radiators, heat exchangers, heater cores, oil coolers, condenser and evaporator coils and EGR coolers.

Company Borg-Warner Corp. County \_\_\_\_\_ Plant Size 293,000 sq ft  
 (Borg & Beck Division)

Plant Sterling Heights Congressional District \_\_\_\_\_

6700-18½ Mile Road  
 Sterling Heights, MI

Address 48078 Standard Metropolitan \_\_\_\_\_ No. of Employees 728  
 Statistical Area

Telephone (313) 739-6000 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)          | Capacity | Processes Used | Consumed by (Automotive) |
|--------------------------------|----------|----------------|--------------------------|
| Torque converters;<br>clutches | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-3. STERLING HEIGHTS PLANT



Borg-Warner Corp.  
 (Borg & Beck Div.) County \_\_\_\_\_ Plant Size 284,250 sq. ft.

Plant Chicago Congressional District \_\_\_\_\_

Address 6558 S Menard Ave.  
 Chicago, IL 60638 Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 600

Telephone (312) 767-7500 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Automatic slack adjusters; torsional couplings; clutches; torque converters. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-4. CHICAGO PLANT

Borg-Warner Corp.  
 (Long Manufacturing  
 Division) \_\_\_\_\_ **County** \_\_\_\_\_ **Plant Size** 52,000 sq. ft.

**Plant** Coldwater \_\_\_\_\_ **Congressional District** \_\_\_\_\_  
 575 Race Street  
 Coldwater, MI 49038  
**Address** \_\_\_\_\_ **Standard Metropolitan** \_\_\_\_\_ **No. of Employees** 95  
**Statistical Area** \_\_\_\_\_

**Telephone** (517) 279-7541 \_\_\_\_\_ **Primary SIC Code(s)** \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Heavy-duty radiators; heat exchangers; heater cores; oil coolers; condenser and evaporator coils; EGR coolers. | N.C.A.   | N.C.A.         | N.C.A.                   |

Company Borg-Warner Corp. (Long Manufacturing Div.) County Plant Size 10,000 sq ft

Plant Burlington Congressional District

3228 S. Service Rd Standard Metropolitan No. of Employees 95  
Burlington, ONT Statistical Area

Telephone (416) 681-1141 Primary SIC Code(s)

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Heat exchangers; heater cores; CT and fin-and-tube radiators; oil coolers; condenser and evaporator coils; EGR coolers. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-6. BURLINGTON PLANT

Borg-Warner Corp.  
 (York Automotive Div.)  
 Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size 500,000 sq ft

Plant Decatur Congressional District \_\_\_\_\_  
 625 Southside Drive  
 Address Decatur, IL 62525 Standard Metropolitan 700  
 Statistical Area

Telephone (217) 428-4841 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Vane rotary and conventional reciprocating air conditioner compressors | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-7. DECATUR PLANT

Borg-Warner Corp.  
(New Bedford Gear  
Div.)

Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size 142,000 sq ft

Plant New Bedford Congressional District \_\_\_\_\_

Address Braley Road  
New Bedford, MA  
02745 Standard Metropolitan  
Statistical Area \_\_\_\_\_ No. of Employees 180

Telephone (617) 995-2616 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Timing gears; manual transmission gears; timing sprockets; customer screw machine parts. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-8. NEW BEDFORD PLANT

Borg-Warner Corp.  
 Company (Rockford Div.) County \_\_\_\_\_ Plant Size 610,000 sq ft

Plant Rockford Clutch Plant Congressional District \_\_\_\_\_

1200 Windsor Road  
 Address Rockford, IL 61101 No. of Employees 1010

Standard Metropolitan  
 Statistical Area \_\_\_\_\_

Telephone (815) 633-7460 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Hydraulic power shift clutches; mechanical clutches (wet and dry); speed reducers; multiple-disc clutches; fan drive system; power takeoffs (engine); torque converters. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-9. ROCKFORD CLUTCH PLANT

Company Borg-Warner Corp. (Rockford Div.) County \_\_\_\_\_ Plant Size 346,000 sq ft

Plant Rockford Drive Line Plant Congressional District \_\_\_\_\_

Address 1200 Windsor Road Rockford, IL 61101 Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 550 ;

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Axle and transmission yokes; brake flanges; drive lines; driveshafts; universal joints; flange fittings. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-10. ROCKFORD DRIVE LINE PLANT

Borg-Warner Corp.  
 Company Ballwin/Washington County Division Plant Size 169,800 sq ft

Plant Ballwin Congressional District  
568 Old Ballwin Road No. of Employees  
Address Ballwin, MO 63011 Standard Metropolitan  
Statistical Area

Telephone (314) 227-5393 Primary SIC Code(s)

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Carburetor components;<br>carburetor tune-up kits;<br>custom non-metallic gas-<br>kets; custom screw<br>machine parts. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-11. BALLWIN PLANT



**Company** Borg-Warner Corp. **County** \_\_\_\_\_ **Plant Size** 120,000 sq ft  
 (Marvel-Schebler/  
 Tillotson Div.)

**Plant** Blytheville **Congressional District** \_\_\_\_\_

**Address** P.O. Box 1765 **No. of Employees** 600  
Blytheville, AK 72815 **Standard Metropolitan**  
**Statistical Area** Standard Metropolitan

**Telephone** (501) 763-0803 **Primary SIC Code(s)** \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Gasoline carburetors;<br>engine controls; fuel<br>pumps; emission controls. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-12. BLYTHEVILLE PLANT

Borg-Warner Corp.  
Company (Marvel-Schebler/  
Tillotson Div.)

County \_\_\_\_\_ Plant Size 178,000 sq ft

Plant Decatur \_\_\_\_\_  
Congressional District \_\_\_\_\_

2195 S Elwin Road  
Address Decatur, IL 62525  
Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 622

Telephone (217) 428-4631 \_\_\_\_\_  
Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Gasoline carburetors;<br>engine controls; emission<br>controls; LP gas carbure-<br>tors; LP gas converters;<br>fuel pumps. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-13. DECATUR PLANT

Borg-Warner Corp.  
(Marvel-Schebler/  
Tillotson Div.)

Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size 100,000 sq ft

Plant Dixon \_\_\_\_\_ Congressional District \_\_\_\_\_

Route 30 East  
Dixon, IL 61021

Address \_\_\_\_\_ Standard Metropolitan \_\_\_\_\_ No. of Employees 400  
Statistical Area \_\_\_\_\_

Telephone (815) 288-4462 \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                                    | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Engine controls; emission controls; ignition components. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-14. DIXON PLANT

Company Borg-Warner Corp. (Morse Chain Div.) County \_\_\_\_\_ Plant Size 1,400,000 sq ft

Plant Ithaca Congressional District \_\_\_\_\_

Address South Aurora Street Ithaca, NY 14850 Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 2,200

Telephone (607) 272-5050 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Chain drives; speed reducers and rod ends; timing chain and sprockets; cam clutches and torque limiters; timing belts; motor speed controls; shaft couplings. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-15. ITHACA PLANT

Borg-Warner Corp.  
(Morse Chain Div.)

Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size 60,000 sq ft

Plant Keokuk Congressional District \_\_\_\_\_

Main St. Road  
Keokuk, IA 52632  
Address \_\_\_\_\_ Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 150

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Chain drives; speed reducers and rod ends; timing chain and sprockets; cam clutches and torque limiters; timing belts; motor speed controls; shaft couplings. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-16. KEOKUK PLANT

Borg-Warner Corp.  
 (Spring/Brummer Div.)  
 Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size 490,000 sq ft

Plant Bellwood Congressional District \_\_\_\_\_

700 S. 25th Ave.  
 Address Bellwood, IL 60104 Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 1,200

Telephone (312) 547-2600 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Friction and steel clutch plates, roller clutches; sprag clutches; overrunning clutches, commutators; transmission brake bands; cushion springs; water pump and oil seals; precision moldings and stampings; Belleville springs. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-17. BELLWOOD PLANT

**Company** Borg-Warner Corp. **Plant Size** 146,000 sq ft  
 (Spring/Brummer Div.) **County** \_\_\_\_\_

**Plant** Frankfort **Congressional District** \_\_\_\_\_

**Address** 300 South Maple **No. of Employees** 340  
Frankfort, IL 60423 **Standard Metropolitan** \_\_\_\_\_  
**Statistical Area** \_\_\_\_\_

**Telephone** (815) 469-2721 **Primary SIC Code(s)** \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Friction and steel clutch plates; roller clutches; sprag clutches; over-running clutches; commutators; transmission brake bands; cushion springs; water pump and oil seals; precision moldings and stampings; Belleville springs; circuit boards. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-18, FRANKFORT PLANT

- . Burlington Plant. The Burlington plant is located in Burlington, Ontario, and is also part of the Long Manufacturing Division. The plant covers 10,000 square feet and manufactures heat exchangers, heater cores, radiators, oil coolers, condenser and evaporator coils and EGR coolers. Ninety-five people work at the plant.
- . Decatur Plant. The Decatur plant is part of the York Automotive Division and is located in Decatur, Illinois. The plant, which covers 500,000 square feet and employs 700 people, makes vane rotary and conventional reciprocating air conditioner compressors.
- . New Bedford Plant. The New Bedford, Massachusetts, plant is part of the New Bedford Gear Division and manufactures timing gears, manual transmission gears, timing sprockets and customer screw machine parts. The plant covers 142,000 square feet and employs 180 people.
- . Rockford Clutch Plant. The Rockford Clutch plant is part of the Rockford Division and is located in Rockford, Illinois. The plant covers 610,000 square feet and employs 1,010 people. Major products include hydraulic power shift clutches, mechanical clutches, speed reducers, multiple-disc clutches, fan drive systems, power takeoffs and torque converters.
- . Rockford Drive Line Plant. The Rockford Drive Line plant is another Rockford Division Plant in Rockford, Illinois. The plant manufactures axle and transmission yokes, brake flanges, drive lines, driveshafts, universal joints and flange fittings. Approximately 550 people are employed in the 346,000-square-foot facilities.
- . Ballwin Plant. The Ballwin, Missouri, plant is part of the Ballwin/Washington Division and manufactures carburetor components, carburetor tune-up kits, custom non-metallic gaskets and custom screw machine parts. The plant has 169,800 square feet.



- . Blytheville Plant. The Blytheville, Arkansas, plant is part of the Marvel-Schebler/Tillotson, Division and manufactures gasoline carburetors, engine controls, fuel pumps and emission controls. The plants employs 600 people and covers 120,000 square feet.
- . Decatur Plant. The Decatur, Illinois, plant is also part of the Marvel-Schebler/Tillotson Division and manufactures gasoline carburetors, engine controls, emission controls, LP gas carburetors, LP gas converters and fuel pumps. The plant employs 622 people and covers 178,000 square feet.
- . Dixon Plant. The Dixon plant in Dixon, Illinois, is part of the Marvel-Schebler/Tillotson Division and produces engine controls, emission controls and ignition components. The plant covers 100,000 square feet and employs 400 people.
- . Ithaca Plant. The Ithaca, New York, plant makes chain drives, timing chain and sprockets, clutches and torque limiters and shaft couplings. This Morse Chain Division plant employs 2,200 people and covers 1,400,000 square feet.
- . Keokuk Plant. The Keokuk, Iowa, plant is also part of the Morse Chain Division. The plant manufactures chain drives and timing chain and employs 150 people.
- . Bellwood Plant. The Bellwood, Illinois, plant makes clutches, springs and pumps. It employs 1,200 people and is part of the Spring/Brummer Division.
- . Frankfort Plant. The Frankfort, Illinois, plant is also part of the Spring/Brummer Division and also manufactures clutches and springs. The plant employs 340 people.

#### 3.4.2 Foreign Plants

Borg-Warner's foreign plants make products similar to those in the U.S. plants, such as torque converters, clutches and transmissions. Listed below are the major foreign automotive plants (see Figures 3-19 through 3-28).

- . Madrid Plant. The Madrid plant has 320 employees and makes clutches.

Company Borg-Warner Corp. County \_\_\_\_\_ Plant Size 487,500 sq ft

Plant Madrid Congressional District \_\_\_\_\_

Address Madrid, Spain Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 320

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)         | Capacity | Processes Used | Consumed by (Automotive) |
|-------------------------------|----------|----------------|--------------------------|
| Automobile and truck clutches | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-19. MADRID PLANT

Borg-Warner Corp.  
 (Stieber Div., Borg-  
 Warner GmbH) County \_\_\_\_\_ Plant Size 140,000 sq ft

Plant Heidelberg Congressional District \_\_\_\_\_

Address Heidelberg, Federal Standard Metropolitan No. of Employees 527  
 Republic of Germany Statistical Area

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Clutches; sprag clutches; roller clutches; overrunning clutches; clutch plates; universal joints; clamping tools; drive shafts; drive lines; flange fittings; fitting yokes; transmission brake bands. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-20. HEIDELBERG PLANT

Borg-Warner Corp.  
(Aisin-Warner Ltd.)

Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size 830,000 sq ft

Plant Anjo \_\_\_\_\_ Congressional District \_\_\_\_\_

Anjo City  
Address Aichi Pref., Japan Standard Metropolitan 1,520  
Statistical Area

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Automatic transmissions;<br>remanufactured automatic<br>transmissions; torque<br>converters | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-21. ANJO PLANT

Borg-Warner Corp.  
(Tsubakimoto-Morse

Company Co., Ltd. County \_\_\_\_\_ Plant Size 160,000 sq ft

Plant Daito Congressional District \_\_\_\_\_

Address Daito City  
Osaka, Japan Standard Metropolitan 300  
Statistical Area No. of Employees \_\_\_\_\_

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Chain drives, speed reducers and rod ends; timing chain and sprockets; cam clutches and torque limiters; timing belts; motor speed controls; shaft couplings | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-22. DAITO PLANT

Company Borg-Warner Corp. County \_\_\_\_\_ Plant Size 120,750 sq ft

Plant Uitenhage Congressional District \_\_\_\_\_

Uitenhage No. of Employees 454  
Cape Province, Standard Metropolitan \_\_\_\_\_  
South Africa Statistical Area \_\_\_\_\_

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)               | Capacity | Processes Used | Consumed by (Automotive) |
|-------------------------------------|----------|----------------|--------------------------|
| Axles, remanufactured transmissions | N.C.A.   | N.C.A.         | N.C.A.                   |

Company Borg-Warner Corp. (Morse-Mexico) County \_\_\_\_\_ Plant Size 160,000 sq ft

Plant Guadalajara Congressional District \_\_\_\_\_

Address Guadalajara Jalisco, Mexico Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 200

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Chain drives; rod ends; timing chain and sprockets; cam clutches and torque limiters; timing belts; shaft couplings. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-24. GUADALAJARA PLANT

Borg-Warner Corp.  
 (Borg-Warner Australia  
 Ltd. Transmission  
 Axle Div.)

Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size 520,000 sq ft

Plant Fairfield Congressional District \_\_\_\_\_

Fairfield, N.S.W.  
 Australia

Address \_\_\_\_\_ Standard Metropolitan \_\_\_\_\_ No. of Employees 900  
 Statistical Area \_\_\_\_\_

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Manual transmissions; axles; differentials; automotive rear axle assemblies; ring and pinion gears; hydraulic marine transmissions. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-25. FAIRFIELD PLANT



**Company** Borg-Warner Corp. **Plant Size** 284,816 sq ft  
 (Borg-Warner Australia) **County** \_\_\_\_\_  
 Ltd. Transmission  
 Axle Div.)

**Plant** Albury **Congressional District** \_\_\_\_\_

Albury, N.S.W. **Standard Metropolitan** \_\_\_\_\_ **No. of Employees** 450  
**Address** Australia **Statistical Area** \_\_\_\_\_

**Telephone** \_\_\_\_\_ **Primary SIC Code(s)** \_\_\_\_\_

| Products (Automotive)                                    | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Automatic transmissions; hydraulic marine transmissions. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-26. ALBURY PLANT

Company Borg-Warner Corp. (Transmission Div.) County \_\_\_\_\_ Plant Size 990,000 sq ft

Plant Kenfig Congressional District \_\_\_\_\_

Address Kenfig, South Wales Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 2,100

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Automatic transmissions; torque converters; precision stampings. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-27. KENFIG PLANT

Borg-Warner Corp.  
(Borg & Beck Div.)

Company Borg-Warner de Brazil County \_\_\_\_\_

Plant Size 350,000 sq ft

Plant Sao Paulo

Congressional District \_\_\_\_\_

Address Sao Paulo, Brazil

Standard Metropolitan  
Statistical Area \_\_\_\_\_

No. of Employees \_\_\_\_\_

Telephone \_\_\_\_\_

Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                        | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Clutches; clutch facings;<br>disc brake pads | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 3-28. SAO PAULO PLANT

- . Heidelberg Plant. The Heidelberg plant has 527 employees and makes clutches, universal joints and yokes.
- . Anjo Plant. The Anjo City (Japan) plant employs 1,520 people and makes transmissions and torque converters.
- . Daito Plant. The Daito City (Japan) plant employs 300 people and makes chain drives, clutches and timing belts.
- . Uitenhage Plant. The Uitenhage (South Africa) plant employs 454 people and makes axles and remanufactures transmissions.
- . Guadalajara Plant. The Guadalajara plant (Mexico) makes converters and chain drives and employs 200 people.
- . Fairfield Plant. The Fairfield (Australia) plant makes transmissions and employs 900 people.
- . Albury Plant. The Albury plant (Australia) makes transmissions and employs 450 people.
- . Kenfig Plant. The Kenfig (Australia) plant employs 2,100 people and manufactures torque converters and transmissions.
- . Sao Paulo Plant. The Sao Paulo (Brazil) plant has 350,000 square feet and manufactures clutches and disc brake parts.

#### 3.4.3 New Plants and Expansions

Borg-Warner announced in 1979 that it planned to build a \$50 million plastics polymerization and compounding facility at Port Bienville, Mississippi. The new plant, which is scheduled for completion in 1982, will have an annual capacity of 150 million pounds of engineering thermoplastics (ABS) and will employ about 100 people. Borg-Warner stated that the new plant and expansions at other plants will bring its total ABS capacity to more than 800 million pounds per year by 1982, a 40 percent increase.

#### 3.5 FINANCIAL STATUS

Borg-Warner has been making steady progress toward its goal of improving its return on equity.

### 3.5.1 Operations Analysis

Borg-Warner's Transportation Equipment group contributed to the corporate decline in earnings in the middle '70s (see Figure 3-29). When U.S. auto industry sales rebounded in 1976, so did those of the Transportation Equipment group. The automotive units also benefited from a two-year program to trim low-margin products. The Spring/Brummer division, for example, discontinued more than 100 parts or models and still managed to increase sales 44 percent between 1975 and 1976. The years 1977 and 1978 were also good for the Transportation Equipment group. Also in 1978, automotive operations outside the U.S. showed marked improvement.

For the year 1979, each of Borg-Warner's major business areas had gains in sales. Earnings rose 16 percent to \$156 million. Operations outside the United States showed greater improvement, both in sales and earnings, than domestic operations. Overall margins for the year were down slightly from 5.8 percent in 1978 to 5.7 percent in 1979. According to the company, the drop in margins was due to the impact of inflation and its effect on inventory accounting.

### 3.5.2 Capital Analysis

Borg-Warner has consciously reduced its debt to capitalization over the past six years (see Figure 3-30). This has been accomplished by reduction in long-term debt in 1975 and 1976 and the issue of stock in 1977. Baker Industries was acquired in 1977 with cash.

The company plans no increases in debt for another two years. Borg-Warner's vice president and treasurer, William M. Valiant, stated in mid-1979 that Borg-Warner would be able to exceed the \$200 million-plus capital investment program over the next two years without increasing its debt.

## 3.6 RESEARCH AND DEVELOPMENT

Borg-Warner is presently conducting research and development on both a unit- and corporate-wide basis. Over the past five years, a significant amount of work at the Borg-Warner Research Center has been focused on energy. The center is working with advanced turbo equipment, heat transfer, compressor design, and materials usage. Developments in manufacturing technology are supporting division efforts to improve efficiency in energy and materials usage. In transportation, new electronic control technology is being applied to fuel metering and power transmission.

| Year | Sales<br>(\$Millions) | Earnings<br>(\$Millions) | Return on<br>Equity, Percent | Operating Income*<br>Sales | Percent |
|------|-----------------------|--------------------------|------------------------------|----------------------------|---------|
| 79   | 2,717                 | 156                      | 15.4                         | 10.1                       |         |
| 78   | 2,326                 | 134                      | 14.8                         | 11.6                       |         |
| 77   | 2,032                 | 104                      | 12.6                         | 11.0                       |         |
| 76   | 1,862                 | 82                       | 11.7                         | 10.3                       |         |
| 75   | 1,639                 | 45                       | 6.6                          | 7.6                        |         |
| 74   | 1,768                 | 51                       | 7.9                          | 8.0                        |         |

| Year | Earnings<br>Total Assets | Percent | Sales<br>Assets | Earnings<br>Sales | Percent |
|------|--------------------------|---------|-----------------|-------------------|---------|
| 79   | 8.9                      |         | 1.56            | 5.7               |         |
| 78   | 8.6                      |         | 1.48            | 5.8               |         |
| 77   | 7.2                      |         | 1.43            | 5.1               |         |
| 76   | 6.6                      |         | 1.49            | 4.4               |         |
| 75   | 3.6                      |         | 1.33            | 2.7               |         |
| 74   | 4.1                      |         | 1.43            | 2.9               |         |

\*Operating Income = Sales - Cost of Goods Sold - Selling, General and Administrative Expenses, Before Depreciation, Interest, and Income Taxes.

FIGURE 3-29. OPERATING ANALYSIS OF BORG-WARNER

## Sources

| Year | Sales | P/E Ratio <sup>1</sup> | Earnings | Depreciation | Sources                   |  |
|------|-------|------------------------|----------|--------------|---------------------------|--|
|      |       |                        |          |              | Changes in Long-Term Debt | Changes in Owners' Equity Other Than Retained Earnings |
| 79   | 2,717 | 4.4                    | 156      | 59.6         | (8)                       | 2.6  |
| 78   | 2,326 | 4.8                    | 134      | 55.2         | 16                        | (1.1)  |
| 77   | 2,032 | 6.0                    | 104      | 50.9         | 20                        | 59.9   |
| 76   | 1,862 | 6.0                    | 82       | 43.4         | (35)                      | 7.2  |
| 75   | 1,639 | 7.5                    | 45       | 42.8         | (84)                      | (2.9)  |
| 74   | 1,768 | 6.6                    | 51       | 43.1         | 112                       | 2.8  |

## Uses

| Year | Change in Working Capital | Uses                 |           | Long-Term Debt <sup>2</sup> Capitalization % | Coverage <sup>3</sup> | Cap. Exp. Total Assets % | Current Ratio |
|------|---------------------------|----------------------|-----------|--|-----------------------|--------------------------|---------------|
|      |                           | Capital Expenditures | Dividends |  |                       |                          |               |
| 79   | (7)                       | 131                  | 44        | 12.4   | 8.2                   | 7.6                      | 1.9           |
| 78   | 5                         | 151                  | 39        | 13.9   | 10.1                  | 7.0                      | 2.0           |
| 77   | 15                        | 77                   | 34        | 13.8   | 8.7                   | 5.3                      | 2.1           |
| 76   | 68                        | 36                   | 27        | 13.9   | 7.3                   | 2.8                      | 2.2           |
| 75   | (31)                      | 56                   | 26        | 18.1   | 3.4                   | 4.7                      | 2.4           |
| 74   | 75                        | 83                   | 26        | 25.8   | 3.7                   | 6.4                      | 2.6           |

Dollar figures are in millions

<sup>1</sup> Average for the Year<sup>2</sup> Capitalization Defined as Total Liabilities - Current Liabilities<sup>3</sup> Operating Profit/Interest

FIGURE 3-30. CAPITAL ANALYSIS OF BORG-WARNER

Borg-Warner feels that the current trends in the automobile industry toward lighter, fuel-efficient and nonpolluting cars should work to its advantage. It feels that companies with a breadth of expertise and strong research and development skills will be able to make sales gains in this era of technological change.

### 3.7 INDUSTRY RELATIONS

At the end of 1978, a merger plan was proposed by Borg-Warner and Firestone. The plan called for placing James F. Bere of Borg-Warner as chief executive officer of the combined corporation and paying Firestone stockholders securities worth about 60 percent of Firestone's book value. The Firestone family supported the merger. The Firestone Company had just lost money in 1977 and was facing a costly radial tire recall.

In 1979, Firestone requested a higher offer, based in part on the company's improved first quarter results. Bere of Borg-Warner stated, "The Firestone proposal simply asks more than we feel is prudent for our shareholders to pay," and the two companies called off the merger.



#### 4. BUDD\*

The Budd Company, headquartered in Troy, Michigan, is known throughout the world as a leading producer of transportation components and equipment. The company traces its history back to the second decade of this century when Edward G. Budd promoted the concept of stamped steel auto bodies and successfully sold the idea to the Dodge Brothers. In the thirties the company increased its transportation markets as it made the first stainless steel train cars. Today, automotive downsizing has created new opportunities for Budd. The company is a major supplier of plastic molded parts and is expanding its plastics facilities. In addition, the company is researching the forming and structural characteristics of new materials and the structural soundness of new automotive designs. Thyssen AG, a West German steelmaker purchased Budd in 1978. With capital resources and international marketing skill of Thyssen, Budd plans to expand into new technologies and penetrate new international markets.

##### 4.1 CORPORATE SIZE AND STRUCTURE

In 1978 Budd, with sales around \$1.5 billion, was a moderately large supplier of metal and plastic parts to the auto industry. Effective April 25, 1978, Budd was acquired by Thyssen AG, a West German steelmaker.

##### 4.1.1 Revenue, Profit and Employment Statistics

Budd's 1978 sales of approximately \$1.5 billion were higher by about 15 percent than 1977. 1976 earnings were \$27.2 million. Budd's parent, Thyssen, was ranked as the 22nd largest corporation outside the U.S. in 1978, with sales of \$9.2 billion and income of \$61.2 million. Thyssen employs 130,000 people.

##### 4.1.2 Corporate Organization

Budd is operated as an independent subsidiary of Thyssen. The company's activities are divided into four operating groups, each devoting a substantial amount of resources to serve the automotive, trucking and railway industries.

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\* This report contains latest available statistics, released prior to the merging of Budd with a West German Company in 1978.

- Through its Stamping and Frame Products Group, Budd offers skills and facilities in the development and production of automotive and truck body stampings and assemblies. The company offers more than 1500 presses and related assembly equipment used for the manufacture of original equipment body stampings and assemblies for cars and trucks.
- Budd's Plastic Products Group markets fiberglass reinforced polyester compounds and molded products. The automotive industry is a key customer. In addition, the group manufactures cast nylon, Celoron and molded products, spiral tubes and thermoset extrusions.
- The Commercial Products Group designs, engineers and produces stainless steel railway passenger cars. In the past ten years, Budd has delivered more of these cars than any other manufacturer. The group also manufactures a complete line of highway truck trailers.
- Budd's Diversified Products Group includes Budd's Wheel and Brake Division which produces a wide range of steel disc wheels to fit almost any type of commercial vehicle.

#### 4.2 MAJOR MARKETS AND PRODUCTS

Figure 4-1 summarizes the major market and product information for Budd.

| MARKET DATA               |   |
|---------------------------|---|
| Major Markets:            | Automotive, trucking, farm equipment, business machine, industrial and appliance industries |
| Percent Automotive Sales: | 75 (Estimate)   |
| Supplies to:              | General Motors, Ford, Chrysler, American Motors   |
| Major Products:           | Doors, fenders, deck lids, roof frames, brakes, grilles, rail cars                          |

FIGURE 4-1. MARKET DATA FOR BUDD

#### 4.2.1 Major Markets

Budd's major markets are the automotive, trucking, farm equipment, business machine, industrial and appliance industries. The company sells to railroads and government organizations that operate mass transit facilities. Budd is the only major U.S. passenger rail car builder still bidding on contracts.

Budd sells products to all four of the major U.S. auto manufacturers. Car makes that use Budd parts include the Corvette, Continental, Fairmont, Bobcat, Thunderbird, Concord and the Aspen.

#### 4.2.2 Products

Budd's automotive stampings include doors, fenders, deck lids, roofs, quarter panels, frames, control arms and cross members. Fiberglass-reinforced polyester molded auto products include grille opening panels, hood scoops, end caps, roof panels, rear quarter panels, quarter window panels and air extensions. Budd also machines and assembles disc brake components, mostly for Ford cars. Other products from Budd include heaters and warmers for cars, trucks and passenger rail cars.

Budd recently introduced a new sheet molding compound (SMC) material that is 25 percent more flexible and can withstand 55 percent more impact than conventional reinforced polyester sheet molding compound. The "FLEX 2000" material, according to the company, is suited for fenders, decklids, liftgates, hatchbacks and door assemblies where previously only steel could be used. There are reportedly no tooling penalties involved with the use of the material, and its cost is no greater than standard SMC.

Budd says that truck caps are the largest potential use of FLEX 2000 at present, but by 1985 the largest use will be for rear decks, doors and hoods. Budd has two SMC machines in Van Wert, Ohio, to produce the material and anticipates no problems supplying the material in quantity.

In its rail business, Budd was recently awarded a \$133.2 million contract to build 300 cars for the Chicago Transit Authority. Work on the order should extend through 1982. Pullman Standard lost the contract with a bid of \$248 million and Boeing Vertol lost with a \$174.9 million bid. However, in Philadelphia, Budd lost a contract for 110 new subway cars to the Japanese trading firm Nissho-Awai

which bid at \$68 million. Budd's \$81 million bid would have resulted in the hiring of 650-750 employees at its Red Lion plant in Philadelphia. However, Nissho-Awai will assemble the cars in Philadelphia, as stipulated in the contract. In a third contract bid, Budd recently won a contract from Amtrack in Washington for 150 stainless steel rail passenger cars for about \$150 million. Delivery on this order is due to start in 17 months with the order completed 10 months later.

#### 4.3 CORPORATE STRATEGY

Budd was founded as an innovative company and hopes to grow by continuing to innovate. Opportunities, company spokesmen feel, will be created by advancing technology. Budd's research and development in the 1970s will help it introduce products in the 1980s. Other strengths, according to the company, include:

- Worldwide markets and facilities
- International marketing capability
- Access, through the Thyssen organization, to additional technology and to capital for further diversification and growth.

Budd hopes to capture significant market shares of the growth markets of the 80s in material forming and product assembly. Among these are:

- Plastics. Budd has vowed to be in the forefront as car parts shift from metal to plastics. The company's research and development center is creating new plastic materials, fabricating techniques and bonding techniques. Budd's premier product right now is low-shrink sheet molding compounds for use when lightweight, high strength and a Class A finish are required.
- Overseas Markets. Budd has recently developed an "International Railcar," designed for world markets and available in prefabricated form for assembly by the labor of customer countries. Now that Budd is connected with a strong international marketing organization, it feels it will be better able to pursue markets overseas.

#### 4.4 PRODUCTION AND OPERATIONS

Budd operates approximately 36 plants in North America and eight plants overseas.

##### 4.4.1 Major Automotive Facilities

Fourteen of Budd's North American plants sell products to the automotive industry. These plants are listed below. (See Figures 4-2 through 4-14.)

- The Detroit Plant has 1,777,000 square feet and employs 2,500 people. The plant does design, engineering and testing and stamps and assembles body components for cars and trucks. Products include doors, fenders and deck lids for Ford's Mark VI, roofs for the Fairmont and roof rails for the Mustang.
- The Gary, Indiana, Plant has 1,125,000 square feet and 2,100 employees and also stamps and assembles body components. The plant makes the roofs for Ford's Bobcat, Thunderbird, Pinto and Cougar XR-7, the deck lid for the Bobcat, Pinto and Marquis, and doors, hoods, quarter panels and side rails for other Ford cars.
- The Philadelphia Plant with 2,548,000 square feet and 3,270 employees has engineering, test and laboratory facilities and stamps and assembles automobile body components.
- The Kitchener, Ontario, Plant has 768,000 square feet and 2,700 employees. The plant makes frames for General Motors' Malibu, LeMans, Cutlass, Real Sport Coupe, Grand Prix and Monte Carlo. It makes transmission brackets and control arms for Ford's LTD, Lincoln Continental, Mark VI and Marquis, and cross members and bumper reinforcements for other Ford, General Motors and AMC cars.
- Milford Fabricating Company, a Budd subsidiary in Detroit, has 225,000 square feet in its plant and employs 325 people. The company has a complete capability to manufacture prototype sheet metal and plastic parts for body and chassis components.

Company Budd Company County \_\_\_\_\_ Plant Size 1,777,000 sq ft

Plant Detroit Plant Congressional District \_\_\_\_\_

12141 Charlevoix Ave.  
 Address Detroit, MI 48215 Standard Metropolitan  
 No. of Employees 2,500  
 Statistical Area \_\_\_\_\_

Telephone (313) 822-7000 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive)   |
|--|----------|----------------|--|
| Stamped and assembled<br>body components for cars<br>and trucks; design,<br>engineering, test and<br>laboratory facilities<br><br>Doors<br><br>Fender<br><br>Deck lid<br><br>Roof<br><br>Roof rail | N.C.A.   | N.C.A.         | Mark IV<br><br>Mark IV<br><br>Mark IV<br><br>Fairmont<br><br>Mustang |

FIGURE 4-2. DETROIT PLANT

Company Budd Company County \_\_\_\_\_ Plant Size 1,125,000 sq ft

Plant Gary Plant Congressional District \_\_\_\_\_

700 Chase St.  
 Address Gary, IN 46401 Standard Metropolitan 2,100  
 Statistical Area

Telephone (219) 949-8300 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                                     | Capacity | Processes Used | Consumed by (Automotive)                |
|---|----------|----------------|---|
| Stamped and assembled body components for cars and trucks | N.C.A.   | N.C.A.         |   |
| Deck lid  |          |                | Bobcat, Pinto, Marquis                  |
| Roof  |          |                | Bobcat, Thunderbird, Pinto, Cougar XR-7 |
| Door  |          |                | Mustang                                 |
| Hood  |          |                | Marquis                                 |
| Quarter panels  |          |                | Marquis, LTD                            |
| Side rail   |          |                | Granada, Monarch, Versailles            |

FIGURE 4-3. GARY PLANT

Company Budd Company County \_\_\_\_\_ Plant Size 2,548,000 sq ft

Plant Philadelphia Plant Congressional District \_\_\_\_\_

2450 Hunting Park Ave.  
 Address Philadelphia, PA 19132 Standard Metropolitan 3,270  
 Statistical Area

Telephone (215) 225-9100 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Stamped and assembled automotive body components; engineering, test and laboratory facilities | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-4. PHILADELPHIA PLANT



Company Budd Canada, Inc. County Plant Size 768,000 sq ft

Plant Kitchener Congressional District \_\_\_\_\_

1101 Homer Watson Boulevard  
 Address Kitchener, ONT N2G4G5 Standard Metropolitan No. of Employees 2,700  
 Statistical Area

Telephone (519) 744-7141 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)            | Capacity | Processes Used | Consumed by (Automotive)  |
|----------------------------------|----------|----------------|---|
| Automotive chassis and subframes | N.C.A.   | N.C.A.         | Grand Prix, Monte Carlo, Malibu, LeMans, Cutlass, Regal Sport Coupe |
| Frame                            |          |                | LTD, Lincoln Continental, Mark VI, Marquis                          |
| Transmission bracket             |          |                | LTD, Lincoln Continental, Mark VI, Marquis                          |
| Control arm                      |          |                | Thunderbird, Concord, Cougar XR-7                                   |
| Cross member                     |          |                | Seville   |
| Bumper reinforcement             |          |                |   |

FIGURE 4-5. KITCHENER PLANT

Company Budd Company County \_\_\_\_\_ Plant Size 225,000 sq ft

Plant Milford Fabricating Co Congressional District \_\_\_\_\_

19200 Glendale Ave.  
Detroit, MI 48223 Standard Metropolitan 325  
 Address \_\_\_\_\_ Statistical Area \_\_\_\_\_

Telephone (313) 272-8400 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Total capability to manufacture prototype sheet metal and plastic parts for all body and chassis components, fabricate fiber reinforced plastic composite parts and tooling, perform blankholder development and product feasibility work and complete design and build facilities | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-6. MILFORD FABRICATING CO. PLANT

Company Budd Company County \_\_\_\_\_ Plant Size 20,000 sq ft

Plant Polymer Composites Div. Congressional District \_\_\_\_\_

19455 Glendale Ave.  
Address Detroit, MI 48223 Standard Metropolitan 15  
Statistical Area

Telephone (313) 273-9462 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Custom production and prototype plastic injection parts; custom production and prototype vacuum formed parts | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-7. POLYMER COMPOSITES DIVISION

Company Budd Company County \_\_\_\_\_ Plant Size 80,000 sq ft

Plant Ashland Plant Congressional District \_\_\_\_\_

Faultless Drive  
 Address Ashland, OH 44805 Standard Metropolitan 180  
 Statistical Area

Telephone (419) 324-1555 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Machining and assembly of disc brake components for light trucks | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-8. ASHLAND PLANT

Company Budd Company County \_\_\_\_\_ Plant Size 215,840 sq ft

Plant North Baltimore Congressional District \_\_\_\_\_

100 South Poe St.  
 Address North Baltimore, OH Standard Metropolitan 357  
45872 Statistical Area

Telephone (419) 257-2231 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive)   |
|---|----------|----------------|--|
| Fiberglass-reinforced polyester molded products for the automotive, truck, farm equipment, electrical and business machine industries<br><br>Grille opening panel<br><br>Hood scoop<br><br>End caps | N.C.A.   | N.C.A.         | N.C.A.<br><br>Grand Prix, Thunderbird, Marquis<br>Camaro<br>Camaro |

FIGURE 4-9. NORTH BALTIMORE PLANT

Company Budd Company County \_\_\_\_\_ Plant Size 150,000 sq ft

Plant Clinton Plant Congressional District \_\_\_\_\_

11700 Tecumseh-Clinton Highway  
 Address Clinton, MI 48236 Standard Metropolitan 360  
 Statistical Area

Telephone (517) 456-4171 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive)   |
|---|----------|----------------|--|
| Machining and assembly of disc brake components for cars<br><br>Front hub and rotor | N.C.A.   | N.C.A.         | Lincoln Continental, Mark VI, Fairmont, Thunderbird, Concord, Mustang, Granada, Cougar XR-7, Monarch, Spirit |

FIGURE 4-10. CLINTON PLANT

Company Budd Company County \_\_\_\_\_ Plant Size 924,000 sq ft

Plant Detroit Plant (2) Congressional District \_\_\_\_\_

12141 Charlevoix Ave.  
 Detroit, MI 48215  
 Address \_\_\_\_\_ Standard Metropolitan \_\_\_\_\_ No. of Employees 1,315  
 Statistical Area \_\_\_\_\_

Telephone (313) 822-7000 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Steel disc wheels and rims, hubs and drums, and disc brake components for trucks; design, engineering, test and laboratory facilities | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-11. DETROIT PLANT (2)

Company Budd Company County \_\_\_\_\_ Plant Size 185,000 sq ft

Plant Frankfort Plant Congressional District \_\_\_\_\_

3186 County Road 550  
 Frankfort, OH 45628  
 Address \_\_\_\_\_ Standard Metropolitan 185  
 Statistical Area \_\_\_\_\_ No. of Employees \_\_\_\_\_

Telephone (614) 998-2400 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Steel disc wheels and rims for highway trucks, trailers and buses | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-12. FRANKFORT PLANT



Company Budd Company County \_\_\_\_\_ Plant Size 222,046 sq ft

Plant Carey Plant Congressional District \_\_\_\_\_

County Road 96  
 P.O. Box 36  
 Address Carey, OH 43316 Standard Metropolitan Statistical Area  
 No. of Employees 429

Telephone (419) 396-7686 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive)   |
|---|----------|----------------|----------------------------|
| Fiberglass-reinforced polyester compounds and molded products for the automotive, truck, farm equipment, electrical and business machine industries | N.C.A.   | N.C.A.         | N.C.A.                     |
| Roof panel  |          |                | Corvette                   |
| Rear quarter panels   |          |                | Corvette                   |
| Quarter window panel  |          |                | Aspen, Volare, Thunderbird |
| Air extension   |          |                | Firebird                   |
| Grille opening panel  |          |                | Regal Sport Coupe, Cordoba |

FIGURE 4-13. CAREY PLANT

Company Budd Company County \_\_\_\_\_ Plant Size 39,350 sq ft

Plant Van Wert Plant Congressional District \_\_\_\_\_

1276 Industrial Ave.  
 Address Van Wert, OH 45891 Standard Metropolitan 25  
 Statistical Area

Telephone (419) 238-4332 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Fiberglass-reinforced polyester compounds for automotive, truck, farm equipment, electrical and business machine industries | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-14. VAN WERT PLANT

- The Polymer Composites Division in Detroit, which employs 15 people in a 20,000-square-foot facility, custom produces prototype plastic injection and vacuum formed parts.
- The Ashland Plant in Ashland, Ohio, machines and assembles disc brake components for light trucks. The plant has 80,000 square feet and employs 180 people.
- The North Baltimore Plant in Ohio has 215,840 square feet and employs 357 people. The plant molds fiberglass-reinforced compounds and makes grille opening panels for Ford's Grand Prix, Thunderbird and Marquis and hood scoops and end caps for Ford's Camaro.
- The Clinton, Michigan, Plant machines front hubs and rotors for Ford's Lincoln Continental, Mark VI, Fairmont, Thunderbird, Mustang, Granada, Cougar XR-7, Monarch and AMC's Spirit and Concord. The plant has 150,000 square feet and 360 employees.
- The Detroit (2) Plant has 924,000 square feet and employs 1,315 people. The plant makes steel disc wheels and rims, hubs and drums and disc brake components for trucks.
- The Frankfort Plant in Frankfort, Ohio, makes steel disc wheels and rims for trucks, trailers and buses. The plant employs 185 people.
- The Carey Plant in Carey, Ohio, has 222,046 square feet and employs 429 people. The plant molds SMC (fiberglass-reinforced polyester plastic) parts including roof panels and rear quarter panels for the Corvette, quarter window panels for the Aspen, Volare and Thunderbird, air extensions for the Firebird and grille opening panels for the Regal Sport Coupe and the Cordoba.
- The Van Wert Plant in Ohio makes fiberglass-reinforced automotive parts and employs 25 people.

Foreign plants that make automotive components include (see Figures 4-15 through 4-20):

- The Sao Paulo Plant, with 430,000 square feet and 1,600 employees, makes steel disc wheels and rims for highway trucks, trailers and buses and wheels for automobiles, tractors and off-highway vehicles.
- The Recife Plant in Brazil has 56,800 square feet and 200 employees. It produces steel disc wheels and rims for automobiles.
- The Mexicali Plant in Mexico has 70,000 square feet and 185 employees. It makes rims for the passenger car aftermarket.
- The Buenos Aires Plant has 161,600 square feet and 352 employees. It makes automotive stampings, hub and drum assemblies and disc brakes for cars and trucks and truck parts.
- The Tlalnepantla, Mexico, Plant has 693 employees on 108,600 square feet. The plant makes hubs and drums and disc brakes for cars and trucks. Gray and nodular iron castings are made in the plant.
- The San Martin Plant in Mexico has 141,420 square feet, 93 employees and makes hubs and drums and disc brakes for cars and trucks.

#### 4.4.2 New Plants and Additions

Budd recently reached an agreement to purchase Place Machine Sales Corporation of Troy, Michigan, and operate it as a subsidiary. Place has been a privately held company, and the firm is believed to have had shipments worth close to \$30 million in 1979, placing it among the top 10 special machine tool builders in the country. Place is the first machine tool company to be purchased by Budd. It has two machine tool plants—Transfer Machines, Inc., Troy, and Place Machine Corporation, Warren, Michigan. These make a variety of special machine tools, including free palletized, trunnion and shuttle-type transfer machines and dial index machines. The machines are mostly used by the U.S. automakers and their parts suppliers to turn out components in high production volumes. Among the important recent orders received by Place are contracts

Budd Company  
 Borlem, S.A. Empreendimentos  
 Industriais  
 County \_\_\_\_\_ Plant Size 430,000 sq ft

São Paulo Plant  
 Congressional District \_\_\_\_\_  
 Rua Barão do Rio Branco, 20  
 P.O. Box 72  
 07000 Guarulhos  
 S.P., Brazil  
 Standard Metropolitan Statistical Area  
 No. of Employees 1,600  
 Telephone 209-0133  
 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Steel disc wheels and rims for highway trucks, trailers and buses; wheels for automobiles, tractors and off-highway vehicles | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-15. SÃO PAULO PLANT

Budd Company  
 Borlem, S.A., Empreendimentos  
 Industriais

Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size 56,800 sq ft

Plant Recife Plant Congressional District \_\_\_\_\_

Via Prestes Maia  
 Sul, Km. 16

Address (BR-101 Sul-Prazeres) Standard Metropolitan No. of Employees 200

Prazeres, Jaboatão, Statistical Area  
 P.E., Brazil

Telephone 341-0033 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                      | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Steel disc wheels and rims for automobiles | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-16. RECIFE PLANT

Budd Company  
 Ruedas y Estampados  
 S.A. de C.V. County \_\_\_\_\_

Plant Size 70,000 sq ft

Plant Mexicali Plant Congressional District \_\_\_\_\_

Carretera a San Luis  
 Km. 11

Address (Apartado Postal 187) Standard Metropolitan No. of Employees 185  
Mexicali, B.C., Statistical Area  
Mexico

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Rims for the passenger car aftermarket | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-17. MEXICALI PLANT

Budd Company  
 Armetal Industria Argentina  
 de Metales, S.A.C. County Plant Size 161,600 sq ft

Plant Buenos Aires Plant Congressional District \_\_\_\_\_  
 Acceso Norte, Km. 32.3  
 Address 1617 General Pacheco Standard Metropolitan \_\_\_\_\_ No. of Employees 352  
 Buenos Aires, Argentina Statistical Area \_\_\_\_\_  
 Telephone 748-1563 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Automotive stampings;<br>truck chassis frames,<br>truck cast wheels and<br>refuse bodies; hub and<br>drum assemblies and<br>disc brakes for cars<br>and trucks; various<br>machined castings | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-18. BUENOS AIRES PLANT



Company Budd Company County \_\_\_\_\_ Plant Size 108,600 sq ft  
Auto Manufacturas, S.A.

Plant Tlalnepantla Plant Congressional District \_\_\_\_\_

Address Apartado Postal 15-138 No. of Employees 693  
Mexico 15, D.F. Standard Metropolitan Statistical Area \_\_\_\_\_

Telephone (905) 565-3606 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Hubs and drums, and disc brakes for cars and trucks; cast wheels for trucks and trailers. Gray and nodular castings and machining. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-19. TLALNEPANTLA PLANT

Company Budd Company County \_\_\_\_\_ Plant Size 141,420 sq ft  
Auto Manufactureras, S.A.

Plant San Martin Plant Congressional District \_\_\_\_\_  
 Km. 2.5  
 Carretera a Moyotzingo  
 San Martin Texmelucan  
 Address Puebla, Mexico Standard Metropolitan 93  
 Statistical Area \_\_\_\_\_

Telephone 40-272 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Hubs and drums and disc brakes for cars and trucks. Gray iron castings and machining. | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 4-20. SAN MARTIN PLANT

from General Motors Corporation for inline transfer machines and rotary machines for its new engine plant near Saltillo, Mexico, which will be producing V-6 engines. Place is believed to be building machines for use in the crankshaft, connecting rod, oil pump and water pump lines in that plant.

Budd's acquisition of Place is similar to Bendix's acquisition of Warner & Swazey. In both cases, independent companies successful in offering high productivity metal-working machinery were sought out by larger manufacturing companies. Budd is not expected to require any new debt for the acquisition.

Place is to be operated by the current management, independent of Budd. Top management of Place will report to the Budd Company vice president of corporate development. Place hopes to expand its offerings to serve markets other than the automotive market. Under such an expansion plan, Place would use Budd money to increase floor space at its Michigan facilities, according to news reports. Budd has made other acquisitions recently, including a plastics machinery builder in Canada and an engineered plastics company in Connecticut.

#### 4.5 FINANCIAL STATUS

Budd had sales of approximately \$1.5 billion in 1978 while Thyssen had sales of \$9.2 billion and earned \$68 million. With Budd's stock price around \$23, Thyssen offered \$34 per share for the company. Thus the purchase, which went into effect April 25, 1978, had a value of about \$273 million or around 15 percent above the company's book value.

When the merger took effect there were fears at Budd that the control of day-to-day operations would change. However, Budd is operating as an autonomous Western Hemisphere division of Thyssen. The major role of Thyssen so far has been to provide capital for expanding and changing operations. According to Budd chairman, Gilbert Richards, "Capital is hard to come by even if you're successful... With Thyssen and their tremendous cash flow in the Western Hemisphere, we're now able to expand much faster than would have been possible. We will be announcing new SMC plants in the world sometime in the not-too-distant future." According to Mr. Richards, Thyssen technology and marketing, as well as capital, mean that overall, there is now greater opportunity for the Budd Company and its suppliers.

#### 4.6 RESEARCH AND DEVELOPMENT

Budd has research and development projects ongoing in many areas. Some recent projects include:

- All Plastic Electric Car. Budd has developed an all plastic sheet molding compound (SMC) car body for a four-passenger car engineered by Garrett Corporation and sponsored by the U.S. Department of Energy. According to Budd, the plastic body was developed with technology that should be suitable for mass production in the 1980s. In addition, Federal damage resistance requirements have been met in the electric vehicle body program.
- Graphite Car. Budd is working on manufacturing processes and design requirements for auto parts using graphite fiber reinforced material. The company built a car of mostly graphite fiber reinforced materials that met all the goals of structural strength with a weight of 2,504 pounds.
- Lightweight Van. The 600-pound weight reduction of a production van was accomplished by engineering new ideas and new materials—fiberglass, graphite, aluminum and high-strength steel.
- Crashworthiness Experiments. Budd engineers experimentally and analytically examine the performance of new automotive structures to develop crashworthy vehicles that are still light and fuel-efficient.
- SPV-2000. Budd has given a lot of publicity to a new rail car it has developed called the SPV-2000. This car is a self-propelled diesel rail car that Budd claims has lower energy consumption than competitive rail, highway and air vehicles. A prototype car has been built and demonstrated at many sites around the country.

#### 4.7 GOVERNMENT RELATIONS

Budd chairman Gilbert F. Richards has proposed an international automotive council to consist of a "chief executive from each major car maker in the world and an automotive administrator of top rank from emerging countries interested in developing automotive business." According to Mr. Richards, the council is needed because the auto industry has become truly interdependent and worldwide, with components and parts being made in different countries for assembly in another country and marketing in still others. He feels the council could meet annually in a week-long session and approach mutual, worldwide problems of the industry from a management viewpoint. "Their essential objective would be to provide a positive force within the worldwide industry to work toward solving the mutual, and basically noncompetitive, problems of pollution, safety and energy, and other large industry challenges, before more government mandates are made."



## 5. COLT INDUSTRIES

Colt Industries manufactures and sells a diversified line of industrial products to the automotive, chemical, aerospace, transportation, construction, electric utility and defense markets. Its major product lines include specialty steels, industrial and power equipment, fluid control systems, industrial seals, shock mitigation systems and firearms. Carburetors, both original equipment and aftermarket units, accounted for approximately 11 percent of the company's 1978 sales and represent the firm's major automotive product. Colt also sells steel, bearing systems and seals to the automotive manufacturers.

The company sees the current concern with auto fuel economy as a significant opportunity to increase the market penetration of its carburetors and to expand its product line to include non-carburetor fuel management systems. The firm's Fluid Control Systems segment, which produces the line of carburetor products, has steadily increased the size of its contribution to total corporate revenues and profits. Research and development in new fuel delivery systems and a strong retail marketing campaign are intended to reinforce this trend.

### 5.1 CORPORATE SIZE AND STRUCTURE

Colt Industries significantly expanded in the 1960's with the acquisition of four pre-existing corporations. One of the acquisitions was the Holley Carburetor Company which has been in business since the turn of the century and now ranks as the largest independent manufacturer of carburetors in the United States. Among major manufacturers of machinery and equipment, Colt ranks fifth in revenues and fourth in net income.

#### 5.1.1 Revenue, Profit and Employment Statistics

Sales in 1979 were \$2,141 million, up 18 percent over the previous year. Earnings rose 28 percent in 1979 to \$111 million. Colt's international operations accounted for 14 percent of 1978 sales. The company employed about 33,100 people, 9,600 of whom are salaried employees, and labor costs are 33 percent of sales. (See Table 5-1.)

TABLE 5-1. COLT INDUSTRIES  
REVENUES, PROFIT AND EMPLOYMENT

| Year                         | Revenues (Millions) | Profits (Millions) |
|------------------------------|---------------------|--------------------|
| 1979                         | \$2,141             | \$111              |
| 1978                         | 1,808               | 87                 |
| Average Number of Employees: |                     | 32,100 (1979)      |

### 5.1.2 Corporate Organization

Colt's operations are conducted through divisions, organized within five industry segments, and an international segment. The products included in each industry segment consist of the following (See Figure 5-1):

- Industrial and Power Equipment

Fabricated metal products, primarily welded stainless steel pipe and tubing marketed under the Trent brand name; weighing systems, industrial diesel engines and accessories; compressors, machine tools and measuring equipment; electric distribution transformers; and firearms

- Fluid Control Systems

Automotive carburetors and components, marketed under the Holley brand name; pumps; and aerospace fuel systems and controls

- Materials

Crucible specialty carbon and low-alloy steels; stainless and other special-purpose steels including high-speed, tool, die, valve, and other high-alloy steels; vacuum-melted steels; and titanium alloys

- Industrial Seals and Components

Gaskets, packings, valves, and other devices to prevent leakage and seal out contaminants, primarily marketed under the Garlock brand name; Stemco wheel bearing lubrication systems and other truck products; and France compressor products.



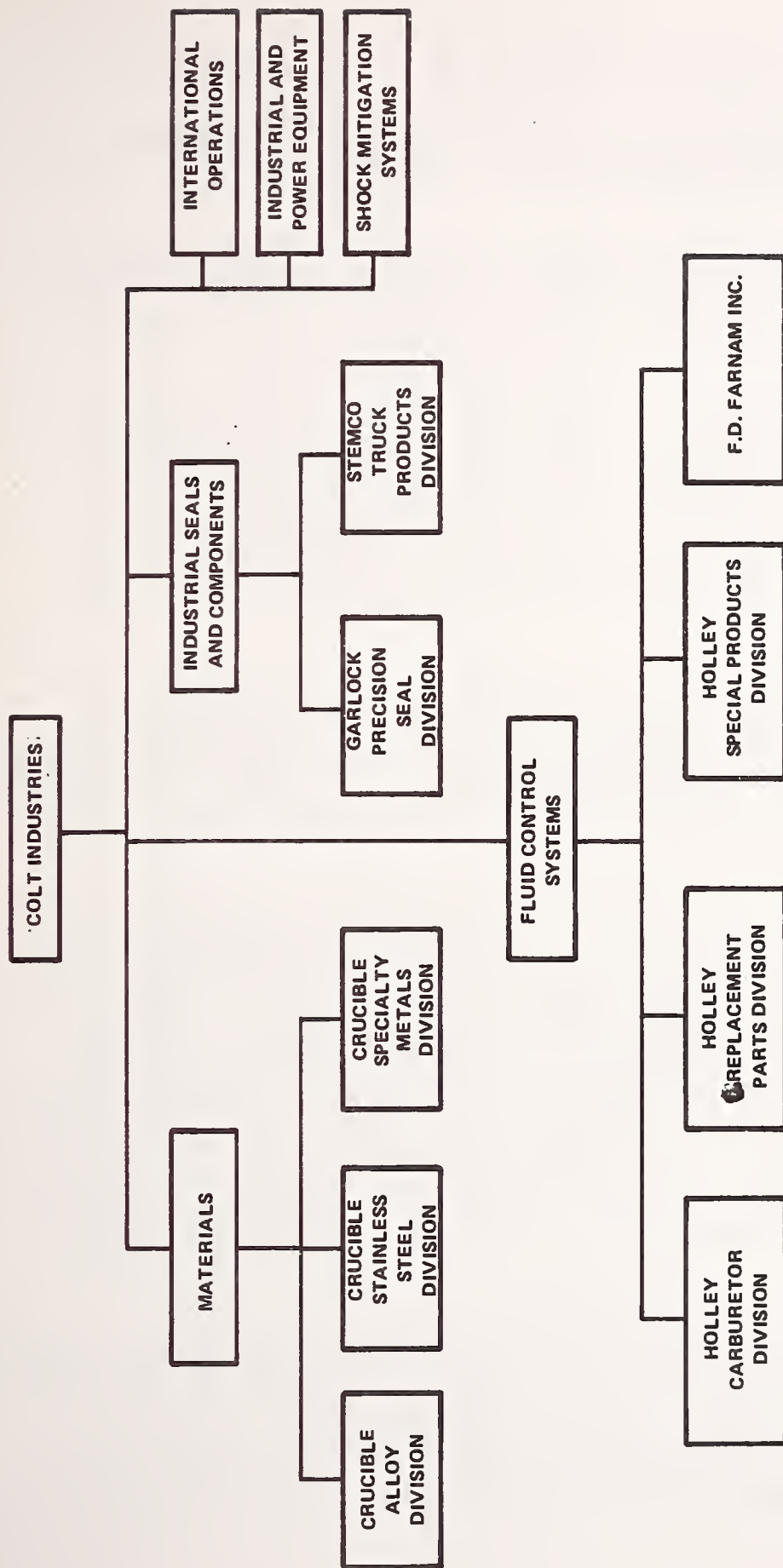


FIGURE 5-1. COLT INDUSTRIES CORPORATE ORGANIZATION

Note: The Divisions shown supply products to the automotive industry.

- Shock Mitigation Systems

Menasco aircraft landing gear assemblies and other shock mitigation systems and flight control systems.

Colt divisions that supply products to the automotive industry are contained in three of the company's segments: Materials, Industrial Seals and Components, and Fluid Control Systems. They are described below.

The materials segment produces alloy and special quality carbon steel ingots, blooms, billets and bars at the Crucible Alloy Division in Midland, Pennsylvania. Also located in Midland, the Crucible Stainless Steel Division produces stainless steel sheet, strip and plate. The Crucible Specialty Metals Division in Syracuse, New York, manufactures conventional high-speed steel, tool and die steels, stainless free-machining bars and rods, and valve steels.

The Industrial Seals and Components segment manufactures automotive oil seals and transmission kits at the Garlock Precision Seal Division in Gastonia, North Carolina. The Stemco Truck Products Division produces wheel lubrication systems, exhaust systems and leaf springs for heavy-duty trucks in Longview, Texas.

The Fluid Control Systems segment is the largest automotive supplier within Colt. The Holley Carburetor Division designs, manufactures and sells original equipment car and truck carburetors and develops non-carburetor automotive fuel management systems. The Holley Replacement Parts Division engineers, distributes and sells Holley products for the automotive aftermarket. The Holley Special Products Division manufactures emission control air injection pumps and controls as well as non-fuel system products. All three Holley divisions have headquarters in Warren, Michigan. F.D. Farnam, Inc., acquired by Colt in 1979, produces gaskets and gasket assemblies for automotive applications in Lyons, Illinois.

## 5.2 MAJOR MARKETS AND PRODUCTS

Figure 5-2 presents a summary of the major market information for Colt Industries, and Table 5-2 shows the five-year trend in sales for Colt's major product groups. Since carburetors and fuel management systems are Colt's major automotive products, the remainder of this chapter will concentrate on the company's three Holley divisions that manufacture those products.

MARKET DATA

Major Markets: Automotive, chemical, aerospace, transportation, construction, electric utility, defense

Percent of Sales to Auto Industry: 25 percent (1979)

Supplies to: American Motors, Chrysler, Ford, General Motors, International Harvester

Major Products: Specialty steels, industrial and power equipment, fluid control systems, industrial seals and firearms.

FIGURE 5-2. COLT MARKET DATA

In 1979, about 25 percent of total company sales were to the automotive industry. The 25 percent consists of 18 percent original equipment market and 7 percent after-market.

TABLE 5-2. COLT SALES BY CLASS OF PRODUCTS

| Class of Products                     | Percentage of Sales |      |      |      |      |
|---------------------------------------|---------------------|------|------|------|------|
|                                       | 1979                | 1978 | 1977 | 1976 | 1975 |
| Stainless Steel                       | 18.1                | 16.8 | 17.8 | 16.0 | 17.0 |
| Specialty Carbon and Low Alloy Steels | 13.2                | 14.0 | 14.7 | 14.5 | 18.6 |
| Industrial Seals and Components       | 14.2                | 13.8 | 13.5 | 13.4 | -    |
| Carburetors and Components            | 10.7                | 11.2 | 9.4  | 9.1  | 9.9  |

### 5.2.1 Major Markets

The Holley Company grew substantially after its acquisition by Colt in 1968. In the five years following 1969, the sales of Holley products quadrupled, and by 1978 sales of Holley carburetors accounted for 11.2 percent of Colt's total sales. In that year, Colt divided Holley into three divisions, each with a specific product and market area assignment.

The Holley Carburetor Division primarily serves the original equipment market, selling carburetors and carburetor components to American Motors, Chrysler, Ford, General Motors, International Harvester and several foreign auto manufacturers. The Holley Special Products Division also serves the original equipment market, manufacturing and marketing emissions control air pumps.

The Holley Replacement Parts Division serves the automotive aftermarket through auto parts distributors and retail stores. It distributes replacement carburetors, fuel pumps, intake manifolds and emissions control system components. The division also supplies high-performance carburetors, fuel pumps and air-intake manifolds to professional car racers and the car enthusiasts market.

### 5.2.2 Products

The Holley divisions' primary automotive products are carburetors, carburetor parts and repair kits, fuel metering systems, intake manifolds, electric and mechanical fuel pumps, air pumps and other emission control systems.

#### *Sales Strategy*

Holley's approach to the original equipment market is based on a long-standing relationship with the auto manufacturers. The divisions stress the following points:

- Over 75 years of experience in designing and manufacturing automotive carburetors
- Status as the largest independent American producer of carburetors and one of the largest in the world
- Leadership in adapting carburetor designs to fulfill Federal requirements for both fuel economy and reduced auto emissions.

The company's strategy toward the automotive after-market places a heavy emphasis on retail advertising and promotional support for Holley's distributor network. Holley products are regularly advertised in car enthusiast magazines and related publications, such as Popular Mechanics. The advertising campaign emphasizes two product lines. One is the "Economaster" carburetor line targeted at car owners who are concerned with fuel efficiency. The other, aimed at car enthusiasts, features Holley's high-performance carburetors, marketed under the name of "The System." Some of the company's ads feature testimonials from Smokey Yunich, well known auto mechanic and a regular Popular Science columnist.

#### *New Product Plans*

Holley has announced that it is working on several new products for both the original equipment market and the aftermarket. For several years, the company has been producing carburetors for electronic closed loop fuel metering. Sensors located at several points in the engine feed inputs to the system which adjusts the fuel mixture to achieve maximum catalytic converter efficiency at varying engine temperatures and in different environments.

Holley is now working on an improvement of the system that features an adjustable open loop design that will permit certain adjustments by the driver. Using a dashboard dial, the driver will be able to change the fuel mixture to give a desirable balance of fuel economy and performance. The system will provide the driver with a constant read out of his current fuel economy in miles per gallon.

While continuing work on electronic carburetors and on further improvements in the traditional venturi carburetor, Holley is also looking ahead to non-carburetor fuel delivery systems. The divisions' researchers are concentrating on the development of a central-point, microprocessor-controlled, fuel injection system. The prototype system uses a Holley-designed throttle body to deliver incoming air at sonic speed, resulting in greatly improved cylinder-to-cylinder fuel distribution. The prototype is being designed to be compatible with existing sensors and electronic control systems and is currently being tested on a variety of vehicles.

During 1979, Holley announced several new products. In the original equipment market, Holley announced that Holley Special Products Division and the Garrett Corporation had reached agreements with Ford to enter into multi-year

contracts to supply turbochargers for Ford's passenger cars. Holley will be a licensee of Garrett for the product and will expand production facilities over the next two years to meet Ford's requirements. Holley will also sell Ford carburetors for its new four-cylinder car, the Erika, beginning in the 1981 model year.

The replacement parts product line was also expanded in the last year to include carburetor systems for foreign imports, beginning with the most popular Datsun models. For the high-performance market, Holley announced new dual, four-barrel manifolds for both big-block Chevy engines and small-block Chrysler engines.

### 5.3 CORPORATE STRATEGY

Colt views the Holley divisions as central to the company's growth strategy for the coming years. The divisions' sales have increased steadily over the last four years, and the Fluid Control Systems segment, dominated by the Holley product line, accounted for 25 percent of Colt's total profits in 1978. The decision to divide Holley into three operating divisions in 1978 was designed to foster continued expansion of the segment.

Optimism about Holley's growth potential is based on the continuing demand by the Federal government and by consumers for automobiles that are more fuel efficient and less environmentally harmful. Colt believes that it can offer carburetors and related products meeting these requirements to both the auto manufacturers and the replacement market. Using the strength of its large market share, Colt is offering regular improvements to the traditional carburetors that it manufactures while planning to phase in fuel injection systems gradually over the coming period. The company believes that the regulatory climate also favors continued aggressive marketing of Holley emissions control air pumps and F.D. Farnam carburetor gaskets. The Holley Special Products Division recently enlarged its Oklahoma plant to produce a new line of air pumps for use in the emissions control systems of smaller cars.

### 5.4 PRODUCTION AND OPERATIONS

The Holley divisions operate eight plants in five states. Five of these are volume manufacturing plants for the divisions' diversified line of automotive products. One is devoted to packaging, one to warehousing and shipping, and one serves as headquarters for the three divisions.

The combined facilities total over 1,000,000 square feet of operating space. (See Figures 5-3 through 5-7.) They are described below.

#### Warren, Michigan, Plant

The headquarters of all the Holley Divisions are located in Warren, Michigan. Activities at the central facility include administration, engineering, research and development, manufacturing support, quality control, marketing, data processing, finance and personnel. All Holley product development is centered in Warren along with a wide variety of customer support services. Of its 198,000 square feet of space, approximately half is devoted to engineering activities.

#### Paris, Tennessee, Plant

The Holley plant in Paris, Tennessee, is a high-volume, integrated facility for the manufacturing and testing of single-barrel and two-barrel carburetors. Much of the plant equipment was designed exclusively for carburetor manufacturing and testing by Holley's manufacturing support group. The facility covers 175,000 square feet and is a major employer in the area with 1,000 workers. In 1979, Colt announced that Paris will be the site of a new master test facility that will service all of the Holley divisions.

#### Bowling Green, Kentucky, Plant

Holley has three facilities in Bowling Green, Kentucky: a manufacturing plant, a service packaging plant and a newly-constructed carburetor assembly and test plant. The manufacturing plant produces two-barrel carburetors for the Chevrolet Chevette, truck carburetors for several manufacturers and most of the Holley automotive aftermarket and original equipment service carburetors. The service packaging plant has more than 300,000 square feet and is devoted to the packaging of Holley products for both the original equipment service market and for aftermarket customers.

In 1978, Colt began the construction of a third Bowling Green facility—a 140,000-square-foot plant for assembling and testing carburetors. In making the new plant announcement, a company spokesman predicted that "the new facility would provide the capacity to meet expected increased demand for the Holley line of fuel-efficient carburetors for 1980 and 1981 model year cars and trucks." The new facility raised the number of Holley employees in Bowling Green by 400 to 500 to 3,100.

Company Colt Industries County \_\_\_\_\_ Plant Size 198,000 sq ft

Plant Holley Headquarters Congressional District \_\_\_\_\_

11955 E. Nine Mile Road

Address Warren, MI 48090 Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
Statistical Area

Telephone (313) 497-4000 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)           | Capacity | Processes Used | Consumed by (Automotive) |
|---------------------------------|----------|----------------|--------------------------|
| Engineering<br>R&D<br>Marketing | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 5-3. WARREN HEADQUARTERS DATA



Company Colt Industries County \_\_\_\_\_ Plant Size 175,000 sq ft  
Holley Carburetor Div.

Plant Paris Congressional District \_\_\_\_\_

Address P.O. Box 580  
Paris, TN 38242

Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 1,000

Telephone (901) 642-3511 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                    | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Single-barrel and two-barrel carburetors | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 5-4. PARIS PLANT DATA

Company Colt Industries County \_\_\_\_\_ Plant Size 456,000 sq ft  
Holley Carburetor Div. (3 plants)

Plant Bowling Green Congressional District \_\_\_\_\_

1801 Russelville Rd.  
 Address Bowling Green, KY Standard Metropolitan 3100  
42101 Statistical Area

Telephone (502) 782-3230 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                                | Capacity | Processes Used | Consumed by (Automotive)                       |
|--|----------|----------------|--|
| Auto and truck carburetors and carburetor components | N.C.A.   | N.C.A.         | Chevrolet and other OEM customers, auto market |

FIGURE 5-5. BOWLING GREEN PLANT DATA

Company Colt Industries County \_\_\_\_\_ Plant Size 207,000 sq ft  
Holley Carburetor Div.

Plant Water Valley Congressional District \_\_\_\_\_

P.O. Box 727  
 Address Water Valley, MS Standard Metropolitan \_\_\_\_\_ No. of Employees 436  
38965 Statistical Area

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Carburetors<br>Emission control devices<br>Fuel pumps<br>Distributors | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 5-6. WATER VALLEY PLANT DATA

Company Colt Industries County \_\_\_\_\_ Plant Size 195,000 sq ft  
Holley Special Products Div.

Plant Sallisaw Congressional District \_\_\_\_\_

P.O. Box 827  
 Address Sallisaw, OK 74955 Standard Metropolitan 250  
Statistical Area

Telephone (918) 775-9151 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)         | Capacity                 | Processes Used | Consumed by (Automotive) |
|-------------------------------|--------------------------|----------------|--------------------------|
| Air pumps and related devices | 4 million pumps per year | N.C.A.         | OEM                      |

FIGURE 5-7. SALLISAW PLANT DATA

### Water Valley, Mississippi, Plant

After the new Bowling Green plant, Holley's most modern facility is located in Water Valley, Mississippi. The 207,000-square-foot plant supplements the carburetor production of the Paris plant. It also produces a wide variety of emission system devices, fuel pumps, ignition components and other specialized Holley products. The plant employs 436 people.

### Sallisaw, Oklahoma, Plant

The most highly automated Holley facility is the Sallisaw, Oklahoma, plant, built exclusively for the manufacturing of close-tolerance air injector pumps for the control of exhaust emissions. Equipped with modern, high-speed production machinery, the plant has a capacity of approximately four million air pumps per year. The output of the 195,000-square-foot plant is sold to the original equipment market. The plant employs 250 people.

### Nashville, Tennessee, Plant

Nashville, Tennessee, is the main shipping point for all Holley replacement products sold through warehouse distributors, jobbers, retailers, service stations and garages in the automotive aftermarket. Typical aftermarket products include carburetors, carburetor tune-up kits, intake manifolds, fuel pumps, ignition components and custom accessories. The plant covers 120,000 square feet.

## 5.5 FINANCIAL STATUS

Colt's diversification and recent strong performance should make the effects of a downturn less severe than the effects of the 1974-5 slump.

### 5.5.1 Operations Analysis

In the year ended December 31, 1979, Colt sales increased 18 percent to \$2.14 billion, and earnings rose over 1978 to \$111.4 million, both record highs. New orders and backlogs rose 14 and 16 percent, respectively, over the prior year. The 1979 performance was achieved despite downturns in the automotive and housing sectors of the economy and despite the impact of an extended strike at the California facilities of its Menasco Inc. subsidiary.

The performance in 1979 was a continuation of the record-breaking performance of 1978 when earnings rose 25 percent on a 19 percent increase in sales. (See Figure 5-8.) The figures for 1978 and 1979 reflect an accelerating rebound from a sharp drop in sales and earnings that the company experienced in 1975.

The 1975 decline was attributed to two main factors—the exceptional performance of 1974 and a contraction in the market for Colt's specialty steel products. Return on equity in 1974 reached an impressive 36 percent, and 1974 earnings were 189 percent higher than in 1973. Even with the decline, however, the company has consistently posted a return on equity above 16 percent for the last four years. The operating ratio has been stable, and the percentage of earnings to total assets has averaged 6.6 since 1974. Through the acquisition of several new firms, Colt's reliance on steel has declined, with the Crucible divisions currently accounting for 30 percent of total sales, down from 40 percent in 1974.

#### 5.5.2 Capital Analysis

Colt significantly increased its long-term debt in connection with an acquisition in 1977 and a merger in 1975. (See Figure 5-9.) A major stock issuance accompanied the 1977 acquisition. Even with these increased obligations, however, the ratio of long-term debt to capitalization has decreased steadily from over 38 percent in 1975 to less than 30 percent in 1979. Reflecting a similar trend, the coverage ratio has increased since 1975. Capital expenditures have risen each year since 1975, but the percentage of these expenditures to total assets has been fairly constant in the vicinity of 4.5 percent. Dividends have been raised regularly in each of the last five years.

Should Colt seek outside financial assistance, its recent drop in long-term debt and the steady decline in the ratio of the long-term debt to capitalization should facilitate external financing.

| Year | Sales<br>(\$Millions) | Earnings<br>(\$Millions) | Return on<br>Equity, Percent | Operating Income*<br>Sales | Percent |
|------|-----------------------|--------------------------|------------------------------|----------------------------|---------|
| 79   | 2141                  | 111.0                    | 20.3                         | 12.4                       |         |
| 78   | 1800                  | 87.0                     | 17.9                         | 12.4                       |         |
| 77   | 1525                  | 69.5                     | 16.6                         | 12.2                       |         |
| 76   | 1267                  | 61.6                     | 19.3                         | 12.4                       |         |
| 75   | 1023                  | 52.1                     | 18.7                         | 12.2                       |         |
| 74   | 1144                  | 77.3                     | 35.8                         | 15.1                       |         |

| Year | Earnings<br>Total Assets | Percent | Sales<br>Assets | Earnings<br>Sales | Percent |
|------|--------------------------|---------|-----------------|-------------------|---------|
| 79   | 8.7                      |         | 1.7             | 5.2               |         |
| 78   | 7.1                      |         | 1.5             | 4.8               |         |
| 77   | 6.2                      |         | 1.3             | 4.6               |         |
| 76   | 6.8                      |         | 1.4             | 4.9               |         |
| 75   | 6.3                      |         | 1.2             | 5.1               |         |
| 74   | 10.7                     |         | 1.6             | 6.8               |         |

\*Operating Income = Sales - Cost of Goods Sold - Selling, General and Administrative Expenses, Before Depreciation, Interest, and Income Taxes.

FIGURE 5-8. COLT OPERATING ANALYSIS

## Sources

| Year | Sources |                        |          |              |                           | Changes in Owners' Equity Other Than Retained Earnings |
|------|---------|------------------------|----------|--------------|---------------------------|--|
|      | Sales   | P/E Ratio <sup>1</sup> | Earnings | Depreciation | Changes in Long-Term Debt |  |
| 79   | 2141    | 6.0-4.0                | 111.0    | 47.9         | (30)                      | (19)   |
| 78   | 1808    | 6.4-4.5                | 87.0     | 44.2         | (7)                       | 1.7  |
| 77   | 1525    | 7.3-5.1                | 69.5     | 37.1         | 38                        | 38.7   |
| 76   | 1267    | 6.7-3.4                | 61.6     | 33.8         | 12                        | 2.2  |
| 75   | 1023    | 5.1-3.3                | 52.1     | 27.7         | 22                        | 0.8  |
| 74   | 1144    | 2.7-1.4                | 77.3     | 26.5         | 9                         | NA   |

5-18

## Uses

| Year | Uses                      |                      |           |  |                       | Current Ratio |
|------|---------------------------|----------------------|-----------|--|-----------------------|---------------|
|      | Change in Working Capital | Capital Expenditures | Dividends | Long-Term Debt <sup>2</sup> Capitalization % | Coverage <sup>3</sup> |               |
| 79   | 15                        | 65.7                 | 34.4      | 28.1   | 9.0                   | 2.5           |
| 78*  | 30                        | 56.0                 | 28.8      | 32.4   | 7.5                   | 2.5           |
| 77   | 115                       | 46.1                 | 24.2      | 35.1   | 7.4                   | 3.0           |
| 76   | 49                        | 43.3                 | 20.4      | 36.7   | 7.4                   | 2.7           |
| 75   | (16)                      | 35.8                 | 17.5      | 37.9   | 7.1                   | 2.7           |
| 74   | 43                        | 58.3                 | 12.5      | 38.8   | 8.4                   | 2.9           |

Dollar figures are in millions

\*Acquisition of Menasco Manufacturing Company.

\*\*Merger of Garlock, Inc.

<sup>1</sup> Range for the year<sup>2</sup> Capitalization Defined as Total Liabilities - Current Liabilities<sup>3</sup> Operating Profit/Interest

FIGURE 5-9. COLT CAPITAL ANALYSIS



## 5.6 RESEARCH AND DEVELOPMENT

Colt maintains a research laboratory located near Pittsburgh, Pennsylvania, that is responsible for research and development in special purpose metals. In addition, Colt maintains staffs of engineers and scientists at various locations whose activities are directed at improving the products and processes of each of its five industry segments. Within the Holley divisions of the Fluid Control Systems segment, research and development activities have centered on electronic carburetors and non-carburetor fuel injection systems. Total research, development and engineering expenses averaged about \$17-20 million a year for the past several years. Colt has approximately 690 employees engaged in research, development and engineering activities.

## 5.7 GOVERNMENT RELATIONS

Colt has been involved in lengthy negotiations with the Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Resources (DER) over air and water pollution at its Crucible Alloy division steel plant in Midland, Pennsylvania. The company has worked out a consent decree with DER that provides for abatement procedures, fines and the shutdown of coke operations at Midland by March 1981. Two blast furnaces will cease operations by the end of 1982 under the agreement. Negotiations with the EPA are ongoing.

As part of the agreement with DER, Colt is installing two 170-ton electric arc blast furnaces at Midland at a cost of \$41 million. Estimates for 1979 capital expenditures for environmental control facilities throughout the firm are \$2.8 million. In 1978, such efforts cost \$6.4 million, representing approximately 11 percent of total capital expenditures. In 1977 environmental control costs were \$6.8 million, about 15 percent of the company's capital expenditures for the year.



## 6. GOODYEAR

Goodyear is the world's largest tire and rubber company. While much of the U.S. tire industry has been in a slump for several years due to declining demand and longer-lasting radials, Goodyear continues to invest heavily in modern production facilities. The company has vowed to have the technology and the plants to be competitive in the '80s. Downsizing has reduced tire sizes and is eliminating spares. Also, attempts to improve fuel economy have led to some reduced driving. However, this has also led to increased interest in fuel-efficient tires. Goodyear recently introduced the Arriva Tire, an all-season, fuel-efficient tire.

### 6.1 CORPORATE SIZE AND STRUCTURE

Goodyear is the major OEM and aftermarket tire manufacturer in the United States. It is also the largest radial tire manufacturer in the U.S. and will soon be the largest radial producer in the world. Goodyear has tire operations throughout the world.

#### 6.1.1 Revenue, Profit and Employment Statistics

Goodyear's 1979 sales were \$8.24 billion, up from \$7.49 billion in 1978. However, in the same period earnings dropped from \$226.1 million to \$146.2 million. The company employed about 154,000 people in 1979, including approximately 79,000 in the United States. (See Table 6-1.)

TABLE 6-1. GOODYEAR REVENUES,  
PROFIT AND EMPLOYMENT

| Year  | Revenues (Millions) | Profits (Millions) |
|---|---------------------|--------------------|
| 1979  | \$8,240             | \$146.2            |
| 1978  | 7,490               | 226.1              |
| Average Number of Employees: 154,000 (1979) |                     |                    |

### 6.1.2 Corporate Organization

Most of Goodyear's products are tire- and rubber-oriented. Thus, the corporate organization has a functional rather than a product orientation, with vice presidents who cover areas in marketing, advertising, manufacturing, finance, control and research for large parts of the company. Most company subsidiaries, such as Kelly-Springfield, are also tire-oriented. Goodyear owns 100 percent of Motor Wheel Corporation, the world's largest manufacturer of styled wheels.

## 6.2 MAJOR MARKETS AND PRODUCTS

Figure 6-1 summarizes major market data for Goodyear.

| <u>MARKET DATA</u>                            |   |
|---|---|
| Major Markets:                                | Automobile, truck, farm equipment, construction machinery industries, OEM and aftermarket |
| Percent of Sales to OEM Passenger Car Market: | 11 (est.)   |
| Sells to:                                     | General Motors, Ford, Chrysler, American Motors   |
| Major Automotive Products:                    | Tires, belts, hoses, wheels   |

FIGURE 6-1. MARKET DATA FOR GOODYEAR

### 6.2.1 Major Markets

Sales of tires and related transportation products accounted for approximately 83 percent of Goodyear's sales in 1979. Of this segment, sales of tires and tubes represented 78 percent. Goodyear is a major supplier on a direct sale basis of tires and tubes to original equipment manufacturers in the automobile, truck, farm equipment, and construction machinery industries in the United States and overseas. Sales are also made to the replacement market. Radial tires are now major portions of both the original equipment tire market and the aftermarket.

There are approximately 15 independent members of the tire manufacturing industry in the United States. The major producers are Goodyear, Firestone, Uniroyal, General Tire and B. F. Goodrich. As shown in Table 6-2, Goodyear has the largest share of the OEM market. In 1978 Goodyear supplied approximately 19.5 percent of General Motors' tires, 24 percent of Ford's, 61.5 percent of Chrysler's and 77 percent of American Motor's. The company also competes with

several foreign firms including Michelin, Dunlop-Pirelli, Bridgestone, Continental and Toyo.

TABLE 6-2. MARKET SHARE,  
OEM MARKET, 1978

| Company        | % OEM Tire Purchases |
|----------------|----------------------|
| Goodyear       | 31.5                 |
| Firestone      | 23.5                 |
| Uniroyal       | 20                   |
| General Tire   | 13                   |
| B. F. Goodrich | 9.5                  |
| Michelin       | 2.5                  |

Source: Modern Tire Dealer, January 24, 1979 .

Goodyear markets its aftermarket tires through a large network of dealers and through 1,600 retail outlets and 60 wholesale tire centers operated under the Goodyear name. The entire automotive tire aftermarket is about three times larger than the OEM market. In this market, Goodyear has the leading brand share. (See Table 6-3.) Kelly-Springfield, part of Goodyear, also has a significant share.

TABLE 6-3. BRAND SHARES OF REPLACEMENT  
PASSENGER TIRE MARKET, 1978

| Company           | % Replacement Passenger Tire Market |
|-------------------|-------------------------------------|
| Goodyear          | 13.6                                |
| Sears             | 11.0                                |
| Firestone         | 10.1                                |
| Michelin          | 5.0                                 |
| Wards             | 4.2                                 |
| B. F. Goodrich    | 4.0                                 |
| Atlas             | 3.4                                 |
| Uniroyal          | 3.0                                 |
| J. C. Penney      | 3.0                                 |
| General           | 2.7                                 |
| K-Mart            | 2.6                                 |
| Dunlop            | 2.5                                 |
| Kelly-Springfield | 2.5                                 |
| Dayton            | 2.2                                 |
| Delta             | 1.5                                 |
| Cooper            | 1.3                                 |
| Armstrong         | 1.2                                 |
| Others            | 26.2                                |

Source: Modern Tire Dealer, January 24, 1979 .

Goodyear also sells a variety of industrial, chemical and plastic products. These are sold directly to manufacturers or through independent wholesale distributors. Goodyear is the largest producer of synthetic rubber and the largest supplier of high-purity polyester resin for bottles.

#### 6.2.2 Products

Goodyear's products are grouped according to the following categories:

- Tires - Radials, bias, belted; autos, trucks, buses, other vehicles
- Industrial Products - Air spring products, belts, hoses, sheet rubber, instrument panels, fiberglass body parts, urethane and fiberglass components
- Chemicals - Rubber, polyester
- Motor Wheel Products - Wheels, hubs, brake drums, disc brake rotors, rims
- Films and Flooring Products - Films for the packaging industry, vinyl flooring and countertopping
- Shoe Products - Heels, soles and strips
- Aerospace Products - Wheels, brakes, containers, navigation systems

Several new tire products have recently been successfully introduced. These include:

- The Elliptic Tire - In July 1977, Goodyear introduced the elliptic tire, claimed to provide up to 30 more miles out of every tankful of gas. The tire is kept at high pressure and requires a specially designed wheel. The elliptic tire was also introduced in England and Brazil.
- The Arriva Tire - An all-season tire introduced in December 1979. This tire combines the concept of the Tempo all-season tire introduced in 1977 with better fuel economy and longer tread life. It features the new design concept of natural shape molding and separate tread elements instead of the traditional pattern of ribs and grooves.

Other new tires include a detachable tread tire for big front-end loaders, a radial tire for farm tractors, and a high-performance auto radial tire.

Motor Wheel is the world's largest manufacturer of styled wheels. The company offers styled wheels through manufacturers for a variety of popular cars. In 1979, Motor Wheel introduced an extensive array of new styled wheels for practically every line of mid-year compact cars. The company is also making new wheels for Chevrolet light trucks and jeeps, plus a new space- and weight-saving high pressure spare wheel. Motor Wheel offers some 40 styled wheels for approximately 50 models of new cars and trucks.

### 6.3 CORPORATE STRATEGY

Goodyear is less diversified than certain other tire manufacturers, such as Goodrich and General Tire. The company over the last several years has been investing heavily to modernize its plants and increase radial production capacity. Chairman Charles J. Pilliod has recently stated, "We will have the technology, the plants and the equipment to achieve greater profitability and maintain leadership and growth in the world market throughout the 1980s." Analysts have suggested that Goodyear might like to diversify, but is presently using all its resources in the tire business. Thus Goodyear will likely remain a major factor in the tire industry in the '80s and will remain dependent on the auto industry.

### 6.4 PRODUCTION AND OPERATIONS

Goodyear manufactures its products in 112 manufacturing facilities; 63 plants in the United States and 49 in foreign countries.

#### 6.4.1 Domestic Plants

Listed below are Goodyear's major automotive plants in the United States. (See Figures 6-2 through 6-21.)

- Union City Plant - The Union City, Tennessee, plant employs over 1,000 people and produces an estimated 40,000 passenger tires per day.
- Topeka Plant - The Topeka, Kansas, plant produces 23,000 passenger tires per day and employs over 1,000 people.

Company Goodyear County \_\_\_\_\_ Plant Size 1,973,000 sq. ft.

Plant Union City Congressional District \_\_\_\_\_

Barham Road  
P.O. Box 570  
Address Union City, TN  
38261

Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 1,000+

Telephone (901) 885-2310 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity                                    | Processes Used | Consumed by (Automotive) |
|-----------------------|---|----------------|--------------------------|
| Tires                 | 40,000 passenger tires per day (production) | N.C.A.         | N.C.A.                   |

FIGURE 6-2. UNION CITY PLANT



Company Goodyear County \_\_\_\_\_ Plant Size 3,000,000 sq. ft.

Plant Topeka Congressional District \_\_\_\_\_

Hwy 24 West Topeka  
P.O. Box 1917

Address Topeka, KS 66601 Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 1,000+

Telephone (913) 295-7111 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity   | Processes Used | Consumed by (Automotive) |
|-----------------------|--|----------------|--------------------------|
| Tires                 | 23,000 passenger tires per day plus 5,500 other tires per day (production) | N.C.A.         | N.C.A.                   |

FIGURE 6-3. TOPEKA PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 546,000 sq. ft.

Plant Scottsboro Congressional District \_\_\_\_\_

Hwy 79 By-Pass  
P.O. Box 952  
Address Scottsboro, AL Standard Metropolitan 700  
35768 Statistical Area

Telephone (205) 574-6360 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)      | Capacity | Processes Used | Consumed by (Automotive) |
|----------------------------|----------|----------------|--------------------------|
| Polyester tire cord fibers | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-4. SCOTTSBORO PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 220,000 sq. ft.

Plant Lucky Congressional District \_\_\_\_\_

21200 Lucky Road  
P.O. Box 187

Address Lucky, OH 43443 Standard Metropolitan Statistical Area No. of Employees 300

Telephone (419) 833-4511 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)    | Capacity | Processes Used | Consumed by (Automotive) |
|--------------------------|----------|----------------|--------------------------|
| Automotive foam products | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-5. LUCKEY PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 337,000 sq. ft.

Plant Logan Congressional District \_\_\_\_\_

US Rt. 33 East Logan  
P.O. Box 799

Address Logan, OH 43138 Standard Metropolitan \_\_\_\_\_ No. of Employees 700  
Statistical Area

Telephone (614) 385-5681 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Automotive (and commercial) foam products<br>Molded plastics | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-6. LOGAN PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 970,000 sq.ft.  
 Plant Jackson Congressional District \_\_\_\_\_  
 2219 Chapin  
 Address Jackson, MI 49204 Standard Metropolitan 1,000+  
 Statistical Area  
 Telephone (517) 782-8181 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity   | Processes Used | Consumed by (Automotive) |
|-----------------------|--|----------------|--------------------------|
| Tires                 | 21,000 passenger tires per day plus 3,500 other tires per day (Production, est.) | N.C.A.         | N.C.A.                   |

FIGURE 6-7. JACKSON PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 2,789,000 sq. ft.

Plant Gadsden Congressional District \_\_\_\_\_

464 Goodyear Avenue  
Address Gadsden, AL 35902 Standard Metropolitan 1,000+  
Statistical Area

Telephone (205) 546-6341 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity   | Processes Used | Consumed by (Automotive) |
|-------------------------|--|----------------|--------------------------|
| Tires<br>Tubes<br>Tread | 31,500 passenger tires per day<br>14,500 other tires per day<br>(Production, est.) | N.C.A.         | N.C.A.                   |

FIGURE 6-8. GADSDEN PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 1,846,000 sq. ft.

Plant Danville Congressional District \_\_\_\_\_

Goodyear Blvd.  
Address Danville, VA 24541 Standard Metropolitan 1,000+  
Statistical Area

Telephone (804) 797-1212 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity  | Processes Used | Consumed by (Automotive) |
|-----------------------|---|----------------|--------------------------|
| Tires                 | 7,000 nonpassenger tires per day (Production, est.) | N.C.A.         | N.C.A.                   |

FIGURE 6-9. DANVILLE PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 75,000 sq. ft.

Plant Cartersville Congressional District \_\_\_\_\_

Goodyear Avenue  
P.O. Box 349  
Address Cartersville, GA  
30120

Standard Metropolitan 700  
Statistical Area

Telephone (404) 382-2460 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Tire cord             | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-10. CARTERSVILLE PLANT



Company Goodyear County \_\_\_\_\_ Plant Size 80,000 sq. ft.

Plant Bakersfield Congressional District \_\_\_\_\_

4200 Shepard Street  
Address Bakersfield, CA Standard Metropolitan \_\_\_\_\_ No. of Employees 300  
Statistical Area \_\_\_\_\_

Telephone (805) 832-2650 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)     | Capacity | Processes Used | Consumed by (Automotive) |
|---------------------------|----------|----------------|--------------------------|
| Foam rubber seat cushions | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-11. BAKERSFIELD PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 4,260,000 sq. ft.

Plant Akron (seven plants) Congressional District \_\_\_\_\_

1144 E. Market Street  
Address Akron, OH 44316 Standard Metropolitan 1,000+  
Statistical Area

Telephone (216) 794-2121 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Tires; industrial products; chemicals; wheels; rims; flooring; films and products for defense, space, and industry | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-12. AKRON PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 173,000 sq. ft.

Plant Sun Prairie Congressional District \_\_\_\_\_

Address Goodyear Street  
Sun Prairie, WI Standard Metropolitan 300  
53590 Statistical Area

Telephone (608) 837-7376 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)          | Capacity | Processes Used | Consumed by (Automotive) |
|--------------------------------|----------|----------------|--------------------------|
| Automotive brake hose products | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-13. SUN PRAIRIE PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 132,000 sq.ft.

Plant Stow Congressional District \_\_\_\_\_

4455 Kent Road  
Address Stow, OH 44224 Standard Metropolitan 10  
Statistical Area No. of Employees

Telephone (216) 794-2852 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Tire molds            | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-14. STOW PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 1,786,000 sq. ft.

(Kelly-Springfield Tire Co. Div.)  
 Plant Cumberland Congressional District \_\_\_\_\_

800 Kelly Road  
 Address Cumberland, MD Standard Metropolitan \_\_\_\_\_ No. of Employees 3,200  
21502 Statistical Area \_\_\_\_\_

Telephone (301) 724-2850 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity   | Processes Used | Consumed by (Automotive) |
|-----------------------|--|----------------|--------------------------|
| Tires                 | 10,500 passenger tires per day plus 8,500 other tires per day (Production, est.) | N.C.A.         | N.C.A.                   |

FIGURE 6-15. CUMBERLAND PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 1,880,000 sq. ft.

(Kelly-Springfield Tire Co. Div.)

Plant Fayetteville Congressional District \_\_\_\_\_

Hwy 401 North  
Address Fayetteville, NC  
28301

Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 1,000

Telephone (919) 488-9296 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity   | Processes Used | Consumed by (Automotive) |
|-----------------------|--|----------------|--------------------------|
| Tires                 | 36,500 passenger tires per day plus 500 other tires per day (Production, est.) | N.C.A.         | N.C.A.                   |

FIGURE 6-16. FAYETTEVILLE PLANT

**Company** Goodyear **County** \_\_\_\_\_ **Plant Size** 1,160,000 sq. ft.  
 (Kelly-Springfield Tire Co. Div.)  
**Plant** Freeport **Congressional District** \_\_\_\_\_  
 Route 20  
 P.O. Box 160  
**Address** Freeport, IL 61032 **Standard Metropolitan** \_\_\_\_\_ **No. of Employees** 1,500  
**Statistical Area** \_\_\_\_\_  
**Telephone** (815) 232-4185 **Primary SIC Code(s)** \_\_\_\_\_

| Products (Automotive) | Capacity   | Processes Used | Consumed by (Automotive) |
|-----------------------|--|----------------|--------------------------|
| Tires                 | 14,500 passenger tires per day plus 500 other tires per day (Production, est.) | N.C.A.         | N.C.A.                   |

FIGURE 6-17. FREEPORT PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 1,215,000 sq. ft.  
 (Motor Wheel Corp.)

Plant Lansing Congressional District \_\_\_\_\_  
 1600 N. Larch Street  
 Address Lansing, MI 48909 Standard Metropolitan 3,500  
 Statistical Area

Telephone (517) 485-9131 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)         | Capacity | Processes Used | Consumed by (Automotive) |
|-------------------------------|----------|----------------|--------------------------|
| Wheels<br>Hubs<br>Brake drums | N. C. A. | N. C. A.       | N. C. A.                 |

FIGURE 6-18. LANSING PLANT



Company Goodyear County \_\_\_\_\_ Plant Size 224,000 sq.ft.  
 (Motor Wheel Corp.)

Plant Ypsilanti Congressional District \_\_\_\_\_

717 N. Norris Street  
 Address Ypsilanti, MI 48197 Standard Metropolitan 250  
 Statistical Area

Telephone (313) 483-7474 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)            | Capacity | Processes Used | Consumed by (Automotive) |
|----------------------------------|----------|----------------|--------------------------|
| Brake drums<br>Disc brake rotors | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-19. YPSILANTI PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 190,000 sq. ft.  
(Motor Wheel Corp.)

Plant Mendota Congressional District \_\_\_\_\_

605 17th Street  
Address Mendota, IL 61342 Standard Metropolitan 250  
Statistical Area

Telephone (815) 539-6785 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|------------------------|----------|----------------|--------------------------|
| Wheels (passenger car) | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-20. MENDOTA PLANT

Company Goodyear County \_\_\_\_\_ Plant Size 112,000 sq. ft.  
 (Motor Wheel Corp.)  
 Plant Newark Congressional District \_\_\_\_\_  
 P.O. Box 7928  
 Address Newark, DE 19711 Standard Metropolitan 275  
 Statistical Area  
 Telephone (302) 453-7500 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Wheels                | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 6-21. NEWARK PLANT

- Scottsboro Plant - The Scottsboro, Alabama, plant employs 700 people and makes tire cord fibers.
- Luckey Plant - The Luckey, Ohio, plant employs 300 people and makes automotive foam products.
- Logan Plant - The Logan, Ohio, plant employs 700 people and makes foam products and molded plastics.
- Jackson Plant - The Jackson, Michigan, plant produces an estimated 21,000 passenger tires per day and employs over 1,000 people.
- Gadsden Plant - The Gadsden, Alabama, plant manufactures over 31,000 tires per day and employs over 1,000 people.
- Danville Plant - The Danville, Virginia, plant produces an estimated 7,000 passenger tires per day and employs over 1,000 people.
- Cartersville Plant - The Cartersville, Georgia, plant makes tire cord and employs 700 people.
- Bakersfield Plant - The Bakersfield, California, plant makes foam rubber seat cushions and employs 300 people.
- Akron Plants - The seven plants in Akron, Ohio, with a total of 4,260,000 square feet, employ over 1,000 people and make tires, industrial products, chemicals, wheels, rims, flooring, films and products for defense and space.
- Sun Prairie Plant - The Sun Prairie, Wisconsin, plant employs 300 people and manufactures brake hose products.
- Stow Plant - The Stow, Ohio, plant employs 10 people and makes tire molds.
- Cumberland Plant - The Cumberland, Maryland, plant is part of Kelly-Springfield and produces approximately 19,000 tires per day. The 1.8 million-square-foot plant employs 3,200 people.

- Fayetteville Plant - The Fayetteville, North Carolina, plant is also part of Kelly-Springfield and employs 1,000 people. The plant produces an estimated 36,500 passenger tires per day plus 500 other tires per day.
- Freeport Plant - The Freeport, Illinois, plant is part of Kelly-Springfield and produces an estimated 14,500 passenger tires per day. Fifteen hundred people work at the plant.
- Lansing Plant - The Lansing, Michigan, plant is part of Motor Wheel Corporation and makes wheels, hubs and brake drums. The plant covers 1.2 million square feet and employs 3,500 people.
- Ypsilanti Plant - The Ypsilanti, Michigan, plant, part of Motor Wheel Corporation, makes brake drums and rotors and employs 250 people.
- Mendota Plant - The Mendota, Illinois, plant is part of Motor Wheel and employs 250 people. The 19,000-square-foot plant produces passenger car wheels.
- Newark Plant - The Newark, Delaware, plant is part of Motor Wheel and employs 275 people in the manufacture of wheels.

#### 6.4.2 Foreign Plants

Goodyear has plants in 28 foreign countries. Most of these make tires, a few make industrial rubber products, films or molded products. The location and size of major foreign tire plants are shown in Table 6-4.

#### 6.4.3 New Plants and Expansions

In 1978 one major Goodyear production expansion was completed and another neared completion. Goodyear is developing the most automated radial tire plant in the world in Lawton, Oklahoma. The 180 million dollar plant is the largest production facility ever built by Goodyear. In addition, a 69 million dollar radial auto tire addition

TABLE 6-4  
GOODYEAR'S MAJOR FOREIGN TIRE PLANTS

| Plant                                    | Approximate<br>Floor Space<br>(sq. ft.) | Plant                                    | Approximate<br>Floor Space<br>(sq. ft.) |
|--|---|--|---|
| Americana, Brazil                        | 1,240,000                               | Mexico City, Mexico                      | 978,000                                 |
| Amiens, France                           | 710,000                                 | Morant Bay, Jamaica                      | 125,000                                 |
| Bangkok, Thailand                        | 249,000                                 | New Delhi, India                         | 603,000                                 |
| Buenos Aires, Argentina                  | 906,000                                 | Norrkoping, Sweden                       | 555,000                                 |
| Colmer-Berg, Luxembourg<br>(four plants) | 2,018,000                               | Salonika, Greece                         | 247,000                                 |
| Fulda, West Germany                      | 1,089,000                               | Santiago, Chile (two<br>plants)          | 976,000                                 |
| Glasgow, Scotland                        | 509,000                                 | Sao Paulo, Brazil (two<br>plants)        | 846,000                                 |
| Guatemala City, Guatemala                | 262,000                                 | Sydney, Australia                        | 887,000                                 |
| Izmit, Turkey                            | 258,000                                 | Taipei, Taiwan                           | 206,000                                 |
| Kinshasa, Zaire                          | 230,000                                 | Toronto, Ontario, Canada<br>(two plants) | 1,537,000                               |
| Kuala Lumpur, Malaysia<br>(five plants)  | 214,000                                 | Uitenhage, South Africa                  | 1,044,000                               |
| Lima, Peru                               | 573,000                                 | Valencia, Venezuela                      | 621,000                                 |
| Manila, Philippines (six<br>plants)      | 316,000                                 | Valleyfield, Quebec,<br>Canada           | 985,000                                 |
| Medicine Hat, Alberta,<br>Canada         | 142,000                                 | Wolverhampton, England                   | 1,947,000                               |
| Melbourne, Australia                     | 227,000                                 |  |   |

to the Gadsden, Alabama, plant recently went on-stream. Other recent construction news includes:

- A three million dollar addition to the earthmover test facility at the Goodyear proving ground near San Angelo, Texas.
- Plans for a 75 million dollar project to turn the idle plant #2 tire facility in Akron into a tire development center. Work is underway on this project that will accommodate 1,200 of Goodyear's worldwide research and development force of 3,300 persons. The five-story building is being converted into a complex of offices, laboratories, testing, engineering and design facilities, plus manufacturing capability of up to 2,500 experimental and specialized tires a day.

Goodyear also recently announced the closing of three plants. Two plants in the United States, affecting 1,200 workers, were closed to adjust capacity to the declining market for bias-ply tires. One plant, in Los Angeles, made bias truck tires, and the other, in Conshohocken, Pennsylvania, made bias auto and truck tires. Goodyear's chairman, Charles P. Pilliod, Jr., said the plant closings were necessary because "current economic conditions and the pace at which radials are displacing bias tires in consumer preference have resulted in a market that won't support these two plants." He added that 1979 industry sales projections for auto tires and light truck tires have been reduced substantially because of "import competition, gasoline shortages...recession...and the falloff in sales of new cars for which the rubber industry supplies tires and other components."

The third plant closing was in Glasgow, Scotland, and was reportedly due to a labor dispute. The British work force refused to accept management productivity proposals and Goodyear termed this "industrial suicide." Westi Hansen, chairman of the Goodyear Tire and Rubber Company in Britain, said it was the first time Goodyear had closed one of its international tire manufacturing plants in 81 years of business. He said the plant, which had been losing more than \$20,000 a day for the last year, would be run down over 90 days (March - May, 1979). The Glasgow plant had 680 employees.

## 6.5 FINANCIAL STATUS

Goodyear is passing through a difficult period for the tire industry, but seems destined to survive and prosper in the '80s.

### 6.5.1 Operations Analysis

Goodyear had relatively steady earnings and profit performance over the 1974-1978 period (see Figure 6-22). The ratio of operating income and earnings to sales remained relatively constant while the ratio of sales to assets increased. Thus, returns on assets and equity improved. The poor results in 1976 reflected a 130-day strike by the United Rubber Workers at 15 of Goodyear's major United States plants.

Nineteen seventy-nine was a poor year for Goodyear. Profits for the year were down 35.3 percent as sales increased by 10 percent. The company said the decrease in earnings was due to declining auto sales and start-up costs associated with the transition to new efficient facilities. Other factors included rising raw material costs due to climbing oil prices, slow synthetic rubber sales, rising labor costs and large inventories. In addition, the tire industry has overcapacity in bias tires and this has made price increases difficult.

In the future, raw material and labor costs are expected to rise further adversely affecting Goodyear's future earnings performance. Long-term prospects for the company are still positive due to its commitment to modernize and expand facilities to produce radial tires.

### 6.5.2 Capital Analysis

Goodyear has taken out significant amounts of long-term debt in the last five years (see Figure 6-23). Its debt to capitalization ratio has risen from 32.7 percent in 1974 to 37.8 percent in 1979. Little change has taken place in the



| Year | Sales<br>(\$Millions) | Earnings<br>(\$Millions) | Return on<br>Equity, Percent | Operating Income*<br>Sales | Percent |
|------|-----------------------|--------------------------|------------------------------|----------------------------|---------|
| 79   | 8239                  | 146                      | 6.8                          | 8.5                        |         |
| 78   | 7489                  | 226                      | 11.1                         | 10.7                       |         |
| 77   | 6628                  | 206                      | 10.8                         | 11.2                       |         |
| 76   | 5791                  | 122                      | 6.6                          | 9.5                        |         |
| 75   | 5452                  | 162                      | 9.1                          | 10.7                       |         |
| 74   | 5256                  | 157                      | 9.2                          | 11.3                       |         |

| Year | Earnings<br>Total Assets | Sales<br>Assets | Earnings<br>Sales | Percent |
|------|--------------------------|-----------------|-------------------|---------|
| 79   | 2.8                      | 1.56            | 1.8               |         |
| 78   | 4.6                      | 1.53            | 3.0               |         |
| 77   | 4.6                      | 1.48            | 3.1               |         |
| 76   | 2.9                      | 1.38            | 2.1               |         |
| 75   | 3.8                      | 1.27            | 3.0               |         |
| 74   | 3.9                      | 1.30            | 3.0               |         |

\*Operating Income = Sales - Cost of Goods Sold - Selling, General and Administrative Expenses, Before Depreciation, Interest, and Income Taxes.

FIGURE 6-22. GOODYEAR OPERATIONS ANALYSIS

## Sources

| Year | Sales | P/E Ratio <sup>1</sup> | Earnings | Depreciation | Sources                   |  |
|------|-------|------------------------|----------|--------------|---------------------------|--|
|      |       |                        |          |              | Changes in Long-Term Debt | Changes in Owners' Equity Other Than Retained Earnings |
| 79   | 8239  | 9.0-6.0                | 146      | 227          | 44                        | 2  |
| 78   | 7489  | 5.9-4.9                | 226      | 214          | 196                       | 1.3  |
| 77   | 6628  | 8.4-5.9                | 206      | 204          | 196                       | (16.8)   |
| 76   | 5791  | 14.9-11.9              | 122      | 187          | 50                        | 1.5  |
| 75   | 5452  | 10.3-5.7               | 162      | 182          | (42)                      | 4.7  |
| 74   | 5256  | 8.4-5.4                | 157      | 172          | 111                       | (12.5)   |

## Uses

| Year | Uses                      |                      | Dividends | Long-Term Debt <sup>2</sup><br>Capitalization % | Coverage <sup>3</sup> | Cap. Exp.<br>Total Assets % | Current<br>Ratio |
|------|---------------------------|----------------------|-----------|---|-----------------------|-----------------------------|------------------|
|      | Change in Working Capital | Capital Expenditures |           |   |                       |                             |                  |
| 79   | 38                        | 360                  | 93.1      | 37.8  | 3.2                   | 6.8                         | 2.1              |
| 78   | 256                       | 411                  | 93.0      | 37.9  | 4.4                   | 8.3                         | 2.1              |
| 77   | 164                       | 291                  | 85.9      | 34.0  | 5.2                   | 6.5                         | 2.0              |
| 76   | 90                        | 226                  | 79.0      | 31.2  | 4.6                   | 5.3                         | 1.8              |
| 75   | (41)                      | 285                  | 78.8      | 30.7  | 4.5                   | 6.8                         | 1.8              |
| 74   | 77                        | 282                  | 73.3      | 32.7  | 3.8                   | 7.0                         | 1.8              |

Dollar figures are in millions

<sup>1</sup> Range for the year<sup>2</sup> Capitalization Defined as Total Liabilities - Current Liabilities<sup>3</sup> Operating Profit/Interest

FIGURE 6-23. GOODYEAR CAPITAL ANALYSIS

company's equity accounts (except for retained earnings). Dividends have risen steadily over the last five years, and capital expenditures have recently risen dramatically. Capital expenditures are expected to drop to around \$250 million in 1980 and thus reduce the company's demand for funds.

## 6.6 RESEARCH AND DEVELOPMENT

Goodyear maintains substantial research and development centers for tires and related products in Akron, Ohio, and Colmer-Berg, Luxembourg. As previously discussed, Goodyear is building a new \$75 million technical center for tire design and development in Akron, Ohio. In 1978 Goodyear spent \$151 million on basic and applied research, and on development of new products and manufacturing processes. High-potential research and development items are elevated to project status and a project manager is given complete responsibility for speeding them through the necessary technical, legal, government, production and marketing interfaces.

In 1979 significant achievements were made by Goodyear in several areas:

- Recycling Scrap Rubber - A new process to recycle scrap rubber was developed by Goodyear engineers at the company's plant in Lincoln, Nebraska. The patented process uses a microwave oven to devulcanize discarded rubber by breaking its chemical bond. It then converts the material into sheets of new rubber, ready for immediate reuse. According to Goodyear, scrap rubber can be recycled almost pound-for-pound into new, high-quality rubber, all within one day. The company feels the future of the new process is in its ability to devulcanize specialty rubbers used mainly in industrial rubber products, such as automotive hoses and inner tubes. The new process does not require much floor space and Goodyear is working on plans to install the equipment at various plants.
- Alternatives to Petroleum - Goodyear researchers have been working on producing synthetic rubber raw materials from pine trees rather than petroleum. The company is studying the pine tree as a source of isoprene and a substitute for styrene, both key chemicals in making synthetic rubber and

byproducts of petroleum. According to Goodyear, pine trees also could yield chemical feedstocks for polyester, numerous adhesives and other useful chemicals as well as the paper products for which they are known. According to William H. Robinson, manager of the project, "As the price of oil goes up, the economics of harvesting plants for chemicals become more realistic."

- Composites for Wheels - Engineers at Motor Wheel Corporation are working on a reinforced composite wheel they believe will reduce weight, improve wheel uniformity, eliminate rust and reduce post-finishing operations. According to James Woelfel, senior materials engineer at Motor Wheel, weight savings compared to a mild steel styled wheel are 40 to 50 percent. Wheel uniformity is improved with a composite wheel, and rust will not be a problem. Problems still exist with some performance characteristics of the wheels and manufacturing methods must be perfected. Thus, much further testing is required before the wheel can be used by vehicle manufacturers.

## 6.7 GOVERNMENT RELATIONS

At least three areas of government-company interaction were newsworthy for Goodyear in 1979:

- Tire Gradings - Tire manufacturers were asked by the National Highway Traffic Safety Administration (NHTSA) in 1979 to grade some of their tires according to tread wear, heat resistance and traction. In connection with ratings received for bias tires, NHTSA asked Goodyear and several other manufacturers to produce records and answer questions concerning their grading decisions. According to news accounts, the questions were asked because of the belief that some companies were setting artificially low ratings in order to boost sales of more expensive bias-belted and radial tires. The tire grades are not meant to relate directly to consumer driving but are supposed to allow comparisons among tire products similar to the way EPA miles-per-gallon ratings allow for comparisons among cars.
- Cost of Regulation - According to a recent Goodyear company study, the cost of compliance with government regulations for the company in 1977 was \$46

million, equal to 12 percent of Goodyear's before-tax income. The regulations of seven Federal agencies were examined including the Department of Transportation (DOT), the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA). Amounts cited included:

- DOT, \$14 million for additional tire testing, labeling, recordkeeping and other expenses
- EPA, \$14 million, including expenses to convert four Goodyear plants from coal to gas or oil
- OSHA, accounting for almost \$12 million to meet additional health and safety regulations, including \$2 million to build a new polyvinyl chloride production facility in Niagara Falls, New York.

Goodyear's chairman, Charles J. Pilliod, Jr., stated that "the purpose of these studies was not to judge the benefits or lack of them in Federal regulations, but rather they were an attempt to determine the cost of compliance, to identify specific problem and high-cost areas of regulation, and to provide government officials with data to support regulatory reform."

- Government-Industry Cooperation - Frank R. Tully, Goodyear's director of governmental environment, safety and health assurance programs, spoke of improvements in government-industry cooperation in a speech to a group of construction industry representatives. According to Tully, "Regulators are becoming increasingly knowledgeable about the business they are regulating...The longer we work together, the better informed the regulators become about our operations and problems. At the same time, we come to understand the regulators better, too. The trend is noticeable, and definitely for the good." Tully did say, however, that the proliferation of lawyers between regulators and the industry is forming an unnecessary barrier to good communication between the agencies and industry.

## 6.8 LABOR RELATIONS

United Rubber Workers Union agreements with the five major tire companies expired in 1979. Union leader Peter Bommarito stated last February that President Carter's voluntary wage-price controls were biased in favor of management and that his union would ignore them. Nevertheless, both management and the union indicated no desire to repeat the record 141-day strike that ensued during negotiations for the last contract. In fact, no strikes occurred. Goodyear was the last of the major tire makers to agree to a new contract, which was essentially the same as one approved by Goodrich, Firestone and Uniroyal and included a total worth of 36 percent over three years and pension improvements. There was one important difference. The Goodyear contract does not include a controversial neutrality clause, which requires that the rubber companies remain neutral if the union attempts to organize workers at nonunion tire plants.

## 7. ITT

ITT is a \$17 billion diversified company. It owns major automotive suppliers in both the United States and Europe and supplies a large number of different automotive products to automakers all over the world. ITT has had good performance in its automotive operations and expects these operations to continue to provide strong earnings and cash flow for the company. The company has recently established U.S. plants for three of its well known European companies. Thus, even though the majority of the automotive operations are now European, expansion opportunities are seen in both the U.S. and Europe.

### 7.1 CORPORATE SIZE AND STRUCTURE

ITT is a large multinational company with manufacturing or sales operations in more than 80 countries. The company's Automotive and Sanitary Products Group, which links together the firm's automotive businesses, accounts for 9 percent of ITT's sales and is thus one of the major worldwide automotive parts suppliers.

#### 7.1.1 Revenue, Profit and Employment Statistics

In 1979, ITT had sales of \$17.2 billion, a 13 percent increase over 1978. Earnings declined by more than 42 percent to \$381 million. Earnings in 1979 reflect a deduction of \$320 million for the closing of its Canadian pulp mill. ITT employed approximately 368,000 persons in 1979. (See Table 7-1.) The automotive group employed about 10 percent of total company employees.

TABLE 7-1. ITT REVENUES, PROFIT AND EMPLOYMENT

| Year                         | Revenues (Millions) | Profits (Millions) |
|------------------------------|---------------------|--------------------|
| 1979                         | \$17,197            | \$381              |
| 1978                         | 15,261              | 661                |
| Average Number of Employees: |                     | 368,000 (1979)     |

### 7.1.2 Organization

ITT was recently organized into groups to aid corporate management. The various groups, with sales and earnings indicated in Table 7-2, each report to the president through a member of the office of the chief executive. This eliminates some of the burden on the president that results from trying to keep track of the details of the many businesses of ITT. Below is a description of each of the major business segments. (See Figure 7-1.)

TABLE 7-2. ITT GROUPS' SALES AND PROFITS, 1979\*

| Group                              | Segment                | Sales (%) | Operating Profits (%) |
|------------------------------------|------------------------|-----------|-----------------------|
| Telecommunications and Electronics | Telecom. Equip.        | 31        | 33                    |
|                                    | Telecom. Opns.         | 2         | 8                     |
|                                    | Defense & Avionics     | 4         | 4                     |
|                                    | Subtotal               | 37        | 45                    |
| Engineered Products                | Automotive             | 10        | 12                    |
|                                    | Industrial             | 17        | 18                    |
|                                    | Comp. & Semiconductors | 7         | 9                     |
|                                    | Subtotal               | 34        | 39                    |
| Consumer Products                  | Food Products          | 10        | 4                     |
|                                    | Appliances             | 5         | -1                    |
|                                    | Sheraton Hotels/other  | 6         | 8                     |
|                                    | Subtotal               | 21        | 11                    |
| Natural Resources                  | Timber & Earth         | 6         | 12                    |
|                                    | Energy                 | 1         | 2                     |
|                                    | Subtotal               | 7         | 14                    |
| TOTAL (MILLIONS)                   | -                      | \$17,197  | \$1,203**             |

\* Insurance and Finance Operations are not consolidated with the rest of ITT. Dollar figures in millions.

\*\* Includes unallocated loss of \$98 million.



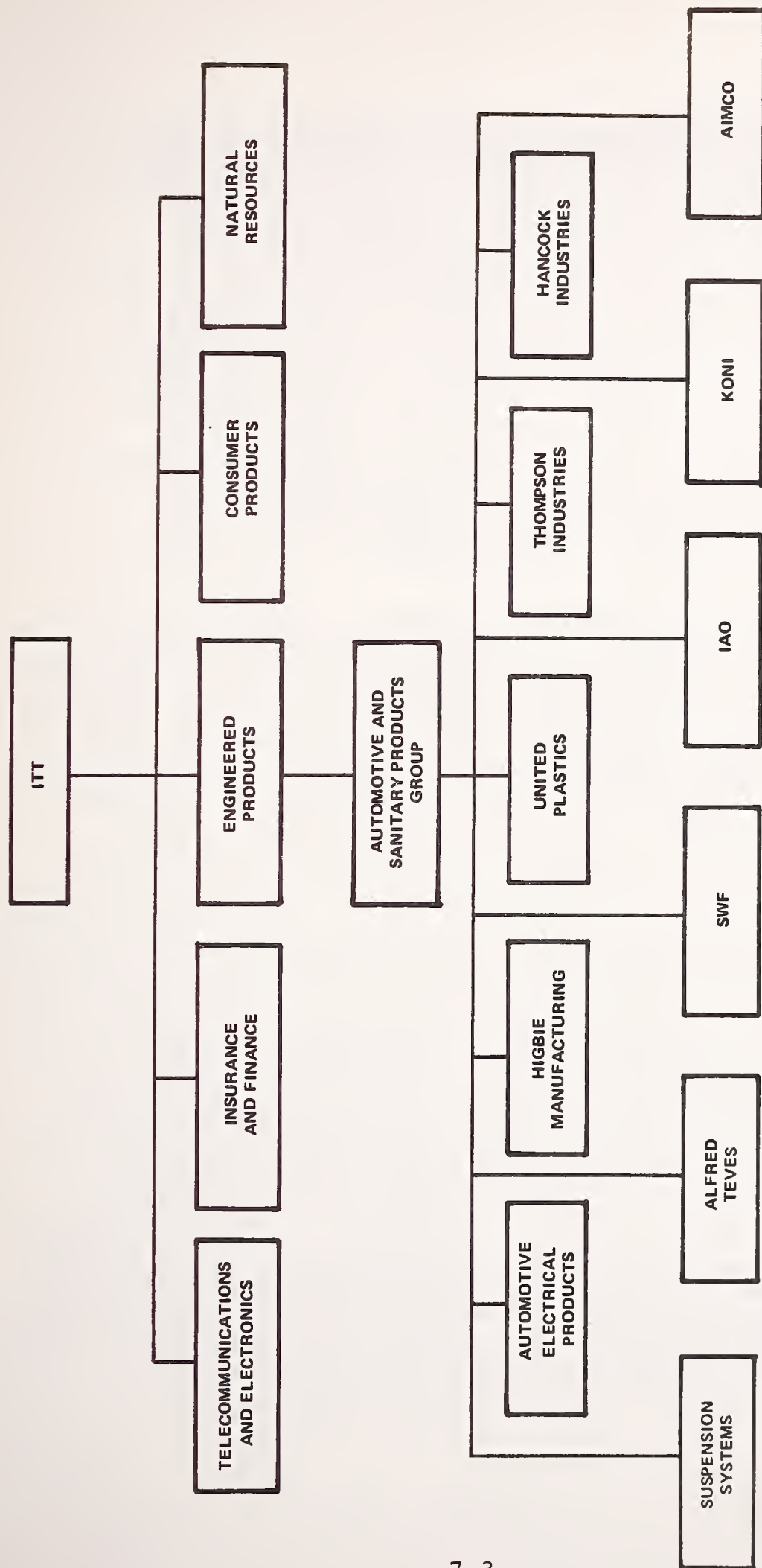


FIGURE 7-1. ITT CORPORATE ORGANIZATION

- Telecommunications and Electronics Group. The Telecommunications and Electronics Group engineers, manufactures, sells and installs a wide variety of communications and electronic equipment, including telephone apparatus, switching systems, commercial microwave systems, private communications systems, teleprinters and other communications equipment. ITT's telecommunications operations provide international telegraph, telex, telephone and other record communication services by submarine cable, satellite and radio. Defense and avionics activities include the manufacture, sale, installation, maintenance and operation of military telecommunications and electronic equipment, chiefly for the U.S. Government. This group accounted for 37 percent of total sales in 1979.
- Engineered Products Group. This group is engaged in the manufacture and sale of automotive equipment and accessories and parts for the original equipment market and aftermarket, equipment for the construction, sanitary and process industries (including temperature and process controls and instruments), pumps and compressors, valves and pipe fittings, wire and cable, components, semiconductors, integrated circuits and electron tubes. This group accounted for 34 percent of total sales in 1979.
- Consumer Products and Services Group. The Consumer Products and Services Group manufactures and distributes food products, consumer appliances and a host of products used in its Sheraton Hotel chain. Food products include the manufacture and wholesale distribution of bread, cakes and snack foods, frozen foods, candy, soft drinks and related products. Other food activities include the processing of various meat products. Consumer appliance units are engaged in the manufacture and sale of consumer electronic products. Hotels and other products and services include a network of hotels and inns in operation under the Sheraton name in 38 countries, cosmetics and toiletry preparations, lawn care products for the do-it-yourself market, publishing and land development. This group accounted for 21 percent of 1979 sales.

- Natural Resources Group. ITT companies are engaged in the production of wood products (lumber, plywood, treated wood products, logs and silvichemicals), and in mining, beneficiating and marketing of silica and attapulgite. Other units are also involved in oil and gas exploration and the operation of such properties, and in the underground mining, preparation and sale of metallurgical coal to steel companies in the United States and abroad, and of steam coal to industrial companies and electric utilities. This group accounted for 7 percent of 1979 sales.
- Insurance and Finance Group. ITT companies write most types of property, casualty and life insurance. In 1979 the group had \$4.8 billion in revenues (not consolidated).

The Automotive and Sanitary Products Division, part of Engineered Products Group, includes 13 automotive product companies in the United States and Europe, and one sanitary products company based in Europe. Division employment averages 38,000 people, of which 27,000 are based in Europe. Seventy-six plants are associated with the division worldwide. The following sections describe the various North American and European operations of the Automotive Group.

#### *North American Operations*

There are seven major ITT automotive operations in North America. Each is described below in terms of the products it manufactures and the number of plants it maintains.

- The ITT Automotive Electrical Products Division (AEPD) maintains 11 plants in North America producing traditional and flat wire harness assemblies, electronic and electromechanical components and systems, and switches. AEPD's recent product developments range from electronic systems for keyless entry to dashboard displays.
- ITT Higbie Manufacturing's four plants produce copper-brazed and welded tubing fabricated from carbon and stainless steels for brake lines and fuel lines, emission control components, push rods, and transmission oil cooler lines. Higbie provides valuable technology to its licensees in the United Kingdom, Germany, Japan and Mexico.

- ITT United Plastics' five manufacturing facilities in the U.S. supply high-quality, custom injection-molded, decorated and bright-plated parts. These parts range from interior trim to exterior grilles and are fabricated from nylon, polypropylene, polystyrene or Noryl. Other United Plastics capabilities include the fields of reaction injection molding and structural foam parts.
- ITT Thompson Industries has two units: its Metals Division supplies wheel ornamentation, bright trim and painted moldings, functional and painted stampings, aluminum bumpers and welded assemblies; its Milrod Division manufactures bumper components, instrument panels and other metal structural stampings.
- ITT Hancock Industries, Inc., with four U.S. plants, manufactures safety-engineered body and chassis hardware, manual and power seat tracks, electric window regulators, hinges and latches.
- ITT Aimco Division, with U.S. and Canadian plants and a foundry, is one of the largest suppliers of brake shoes and disc backing plates for automobiles and light trucks, a major supplier of shoes for heavy trucks, and a foremost supplier to brake system packagers and the aftermarket.
- ITT Suspension Systems, located in Georgia, will produce the "MacPherson Strut" suspension system part for factory installation on front-wheel-drive cars.

#### *European Operations*

There are four primary companies that are part of ITT's European automotive operations. These are described below.

- Alfred Teves GmbH, Frankfurt, Germany. Teves is the world's principal independent manufacturer of disc brakes. It holds technological leadership in the design and manufacture of hydraulic braking systems. The headquarters and main production facilities are in Frankfurt, Germany, and Teves operates several other plants in Germany, as well as facilities in the United Kingdom, Italy, Belgium, Brazil, South Africa and the United States (where a new plant in

Culpeper, Virginia, was opened in 1977). Teves employs 11,000 people. Its product range covers braking systems, bumpers and chassis parts, industrial hydraulic products, and components for aircraft and military vehicles. Teves has developed three generations of disc brakes during the last 15 years. Among products at an advanced research/test stage are anti-skid systems, central hydraulics for cars, a new type of vacuum booster and glass fiber sections for safety bumpers.

- SWF Spezialfabrik fur Autozubehor GmbH, Bietigheim (near Stuttgart), Germany. SWF is a leading supplier of windshield wiper systems and electro-mechanical/electronic components and is the largest European producer of fractional horsepower electric motors. SWF has plants in Germany, Spain and Brazil, with a workforce of 5,700. Its product range comprises: electric motors for automotive and industrial applications, windshield wiper systems and blades, central column switches, relays and switches, fuel pumps and rear lamps. SWF recently added to these operations the L'Orange company of Stuttgart, manufacturer of high precision fuel injection equipment for diesel engines. R&D activity is focused on new applications for electrical motors, (e.g., for head lamp leveling systems, central door locking, etc.), non-reflecting rear lamps, submersible fuel pumps with sender and a major program in the field of electronic monitoring/display technology.
- IAO Industrie Riunite SpA, Turin, Italy. IAO (Italian Automotive Operations) is the major independent automotive components supplier in Italy, manufacturing a broad range of mechanical and plastic automotive components. IAO has operations in Italy, Spain and Germany and operates the largest shock absorber plant in Europe. Its workforce totals 6,600. IAO's product lines include shock absorbers, mufflers, window regulators, fuel pumps, trim, bumpers, oil seals, foam and injected plastic parts, lights, door channels and cigar lighters. New product development

in IAO features monotube shock absorbers, gas springs, self-supporting foam and a new generation of oil seals.

- Koni B V, Oud Beyerland (near Rotterdam, Holland.)  
Koni is a supplier of high-performance shock absorbers for motor vehicles, motorcycles and railroad trains. Koni operates plants in Holland, France and the United States, with 1,200 employees. In addition to its major product line (shock absorbers) Koni manufactures shock "dampers" for suspension bridges, shock testers for garages, vehicle lifts and vehicle heaters. Koni's sales are directed to the replacement market for automotive shock absorbers in 90 countries around the world. Virtually all Formula I racing cars are fitted with Koni shock absorbers, and in the railway sector, Koni's innovative "Yaw Dampers" are tailor-made to the requirements of high-speed trains in several European countries. Koni also selectively supplies original equipment shock absorbers to high performance car manufacturers such as Ferrari and Porsche.

## 7.2 MAJOR MARKETS AND PRODUCTS

The major market information for ITT's automotive group is presented in Figure 7-2.

### 7.2.1 Major Markets

ITT's worldwide presence in the automotive area has increased from \$7 worth of equipment on every car manufactured in the United States and Europe in 1967 to \$50 per car in 1977. The various automotive groups in ITT sell components for autos, aircraft, trucks, buses, military vehicles, motorcycles and high-speed railway cars. About two-thirds of automotive volume is generated in Europe and about one-third in North America. Virtually every automobile manufactured today in the United States, Europe and Latin America, or assembled in Africa, uses some type of ITT system or component. ITT's major customers are listed in Table 7-3. ITT also sells aftermarket parts through full-line warehouse and distribution centers. A separate imported car parts operation sells directly to dealers.

AUTOMOTIVE MARKET DATA

Major Markets: Autos, aircraft, trucks, buses, military vehicles, motorcycles, high-speed railcars

Percent of Sales to Auto Industry: 9 percent

Sells to: AMC, Chrysler, GM, Ford, Volkswagen, Alfa Romeo, Audi, BMW, Mazda, Mercedes-Benz, Porsche, Renault and others

Automotive Products: Brake components, shock absorbers, windshield wipers, electrical components, plastic and metal parts

FIGURE 7-2. ITT  
AUTOMOTIVE MARKET DATA

TABLE 7-3. ITT AUTOMOTIVE  
CUSTOMERS

NORTH AMERICA

American Motors Corporation  
Chrysler Corporation  
Ford Motor Company

- . Ford Division
- . Lincoln-Mercury Division

General Motors Corporation

- . Buick Division
- . Cadillac Division
- . Chevrolet Division
- . Delco
- . Oldsmobile Division
- . Pontiac Division
- . Saginaw Steering Gear Division

Volkswagen of America

EUROPE, SOUTH AMERICA, AFRICA

|                          |               |
|--------------------------|---------------|
| Alfa Romeo               | Lancia        |
| Alfa Sud                 | Magirus       |
| Aston Martin             | MAN           |
| Audi                     | Mazda         |
| Berliet-Savien           | Mercedes-Benz |
| BMV                      | Peugeot       |
| British Leyland          | Porsche       |
| Citroen                  | Renault       |
| Ferrari                  | Saab-Scania   |
| Fiat                     | Seat          |
| Ford                     | Talbot        |
| G.M. (Opel and Vauxhall) | Volkswagen    |
| Innocenti                | Volvo         |
| Iveco                    | White Motor   |

### 7.2.2 Products

ITT's major automotive products include disc brakes, calipers, drum brakes, rotors, master and wheel cylinders, shock absorbers, windshield wipers, steering column switch units, signal lights, traditional and flat wire harness assemblies, electronic systems, copper tubing, injection-molded parts, metal trim, chassis hardware, brake shoes and exhaust systems.

ITT has recently introduced U.S. production of the following three products based on the expertise of its European subsidiaries:

- Disc brake caliper assemblies. In 1977 Alfred Teves, the German brake subsidiary, established its first U.S. facility in Culpeper, Virginia. In 1978 the company received additional long-term contracts for 2.2 million disc brake caliper assemblies annually from this plant, which is now undergoing substantial expansion.
- Shock absorbers. ITT's Koni in Holland produces shock absorbers for cars, motorcycles, trains and buses in plants in France, the Netherlands and West Germany. In 1978 Koni began producing its products in Culpeper, Virginia.
- MacPherson struts. The automotive group recently received a substantial order from a major U.S. car manufacturer for "MacPherson struts," shock dampening devices which have particular application for front-wheel-drive cars. These will be produced by the recently created ITT Suspension Systems Division at a factory to be built in Macon, Georgia.

Other products recently introduced by ITT or in advanced development include preassembled ignition systems that lower installation cost, reduce weight and improve reliability; tubing for diesel engines; electronic dashboard display systems and electronic trip computers; electrical central locking devices; electric submersible fuel pumps which improve fuel economy; anti-skid brake systems; ultra-lightweight seat adjusters; and automotive fluid distribution systems.



### 7.3 CORPORATE STRATEGY

ITT's management has recently addressed the problem of consolidating the corporation's large and varied collection of companies in order to manage them effectively in a fast-changing world. This was done by analyzing ITT's various businesses in terms of the company's strengths. The management has identified ITT's strength as:

- Diversity
- Balanced mix of business
- Worldwide management structure
- Broad technology
- Commitment to technology transfer
- Consumer confidence.

The company's primary goal is to improve profitability and reach a 15 percent return on stockholders' equity in the early 1980s. To accomplish this goal, the company plans to:

- Sharpen its Marketing Skills to Anticipate Customer Needs. ITT wishes to increase emphasis on the customer—discerning his needs and then coming back to the labs to produce what is needed. The company has already started sending managers from all disciplines—from controllers to engineers—through intensive marketing courses to reorient their thinking toward marketing strategies.
- Further Simplify the Company Structure. ITT wishes to more clearly define its businesses to more effectively use its resources and to ensure that it is a decisive competitive force in every business in which it participates.
- Strategically Reposition its Businesses. ITT wants to focus its businesses on its most profitable and rapidly growing areas. The management of each business segment has its own strategy, reflecting the optimum response to its growth potential and competitive situation. ITT is reexamining the consumer products and services business to improve its competitiveness and better concentrate its resources in areas with the highest potential for profitable growth. ITT also sees two of its businesses—insurance and finance and engineered products—as needing comparatively little change. These will contribute substantially to earnings and cash flow in the 80s.

In addition to the above actions, ITT is reportedly trying to increase the percent of its earnings generated in the United States, since Europe has become a less attractive place to do business.\* Thus, even though ITT sees auto components as a prime growth spot in Europe, Alfred Teves' recent expansion was in the United States.

#### 7.4 PRODUCTION AND OPERATIONS

ITT has major automotive facilities in North America, Europe, South America and Africa.

##### 7.4.1 North American Operations Plants

ITT's North American automotive operations have 11 major plants. Each is described below. Summary data on the plants is presented in Figures 7-3 through 7-14.

- Tonawanda Plant. The Tonawanda, New York, plant is part of the Division and makes brake drums and brake shoes. The plant employs 500 people.
- Holly Springs Plant. The Holly Springs, Mississippi, plant makes automotive hardware and wheel covers.
- Valdosta Plant. The Valdosta, Georgia, plant is part of Thompson Industries, Metal Products Division, and makes automotive bright trim. The plant employs 1,800 people.
- Bainbridge Plant. The Bainbridge, Georgia, plant is part of Thompson Industries and makes automotive decorative trim. The plant employs 300 people.
- North Vernon Plant. The North Vernon plant in North Vernon, Indiana, makes metal door frames and is part of Thompson Industries. The plant employs 300 people.
- Valdosta (2) Plant. The Valdosta (2) plant is in Valdosta, Georgia, and makes automotive trim.

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\* Business Week, May 15, 1978.

Company ITT County \_\_\_\_\_ Plant Size \_\_\_\_\_ Unavailable  
 (Aimco division)

Plant Tonawanda Congressional District \_\_\_\_\_  
 435 Creekside Drive  
 Tonawanda, NY  
 Address 14150 Standard Metropolitan \_\_\_\_\_ No. of Employees 500  
 Statistical Area

Telephone (716) 691-6000 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)      | Capacity | Processes Used | Consumed by (Automotive) |
|----------------------------|----------|----------------|--------------------------|
| Brake drums<br>Brake shoes | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-3. TONAWANDA PLANT DATA

Company ITT County \_\_\_\_\_ Plant Size Unavailable

Plant Holly Springs Congressional District \_\_\_\_\_

Address Highway 78 South  
Holly Springs,  
MS 38835 Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees Unavailable

Telephone (601) 252-3361 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)               | Capacity | Processes Used | Consumed by (Automotive) |
|-------------------------------------|----------|----------------|--------------------------|
| Automotive hardware<br>Wheel covers | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-4. HOLLY SPRINGS PLANT DATA

Company ITT County                      Plant Size                      Unavailable  
 (Thompson Ind., Metal Products Div.)

Plant Valdosta Congressional District                     

2206 East Hill  
 Address Valdosta, GA Standard Metropolitan                      No. of Employees 1800  
31601 Statistical Area

Telephone (912) 242-4360 Primary SIC Code(s)                     

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|------------------------|----------|----------------|--------------------------|
| Automotive bright trim | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-5. VALDOSTA PLANT DATA

Company ITT County \_\_\_\_\_ Plant Size \_\_\_\_\_ Unavailable  
 (Thompson Industries)

Plant Bainbridge Congressional District \_\_\_\_\_  
 Old Base Industrial Park  
 P.O. Box 975  
 Address Bainbridge, GA Standard Metropolitan \_\_\_\_\_ No. of Employees 300  
31717 Statistical Area

Telephone (912) 246-5510 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)      | Capacity | Processes Used | Consumed by (Automotive) |
|----------------------------|----------|----------------|--------------------------|
| Automotive decorative trim | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-6. BAINBRIDGE PLANT DATA

Company ITT County Unavailable  
 (Thompson Industries, Inc.) Plant Size Unavailable

Plant North Vernon Congressional District \_\_\_\_\_

1001 2nd Street No. of Employees 300  
 North Vernon, IN Standard Metropolitan  
 Address 47265 Statistical Area

Telephone (812) 346-4301 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Metal door frames     | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-7. NORTH VERNON PLANT DATA

Company ITT County \_\_\_\_\_ Plant Size : Unavailable  
 (Thompson Industries, Inc.)

Plant Valdosta (2) Congressional District \_\_\_\_\_

1101 West Savannah No. of Employees Unavailable  
 Address Valdosta, GA Standard Metropolitan \_\_\_\_\_  
31601 Statistical Area \_\_\_\_\_

Telephone (912) 242-4360 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Automotive trim       | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-8. VALDOSTA (2) PLANT DATA



Company ITT County \_\_\_\_\_ Plant Size \_\_\_\_\_ Unavailable  
 (Hancock Industries)

Plant Jackson Congressional District \_\_\_\_\_

Address 2300 East Ganson No. of Employees \_\_\_\_\_ Unavailable  
Jackson, MI  
49202  
 Standard Metropolitan Statistical Area

Telephone (517) 789-3161 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Automobile body hardware<br>Window regulators<br>Hood hinges<br>Seat adjusters<br>Door latches | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-9. JACKSON PLANT DATA

Company ITT County \_\_\_\_\_ Plant Size Unavailable

Plant Selmer Congressional District \_\_\_\_\_

Address Highway #45 Standard Metropolitan Unavailable  
South Selmer, Statistical Area  
TN 38375

Telephone (901) 645-6142 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Automotive components<br>Interior auto lamps<br>Wiring assemblies | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-10. SELMER PLANT DATA

Company ITT County \_\_\_\_\_ Plant Size Unavailable

Plant Cairo Congressional District \_\_\_\_\_  
Address Highway 84 Standard Metropolitan Unavailable  
North Cairo, GA Statistical Area Unavailable  
31728

Telephone (912) 377-5570 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Electrical harnesses  | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-11. CAIRO PLANT DATA

ITT  
 Company United Plastics County \_\_\_\_\_ Plant Size \_\_\_\_\_ Unavailable  
 (United Plastics)

Plant Drew Congressional District \_\_\_\_\_  
 Highway #49 West  
 Address Drew, MS 38737 Standard Metropolitan \_\_\_\_\_ No. of Employees Unavailable  
 Statistical Area

Telephone (601) 745-8589 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Automotive components | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-12. DREW PLANT DATA

Company ITT County \_\_\_\_\_ Plant Size Unavailable  
 (ITT Rayonier)

Plant Lake City Congressional District \_\_\_\_\_  
 P.O. Box 1449  
 Old Valdosta Highway  
 Address Lake City, FL 32055 Standard Metropolitan Unavailable  
 Statistical Area

Telephone (904) 782-2197 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Automotive trim       | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-13. LAKE CITY PLANT DATA

Company ITT County \_\_\_\_\_ Plant Size Unavailable

Plant Ardel Congressional District \_\_\_\_\_

North Mills Street  
Address Ardel, GA 31620 Standard Metropolitan Unavailable  
Statistical Area

Telephone (912) 896-2261 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| Automotive components | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-14. ARDEL PLANT DATA

- Jackson Plant. The Jackson, Michigan, plant is part of Hancock Industries and makes automotive body hardware, window regulators, hood hinges, seat adjusters and door latches.
- Selmer Plant. The Selmer plant in Selmer, Tennessee, makes interior auto lamps and wiring assemblies.
- Cairo Plant. The Cairo plant in North Cairo, Georgia, makes electrical harnesses.
- Drew Plant. The Drew plant in Drew, Mississippi, makes various automotive components.
- Lake City Plant. The Lake City plant in Lake City, Florida, is part of ITT Rayonier and makes automotive trim.
- Ardel Plant. The Ardel plant is in Ardel, Georgia, and makes various automotive components.

#### 7.4.2 European, South American and African Operations

Alfred Teves operates plants in Frankfurt and several other locations in Germany, as well as facilities in the United Kingdom, Italy, Belgium, Brazil, South Africa and the United States. SWF has plants in Germany, Spain and Brazil. IAO has operations in Italy, Spain and Germany, and Koni operates facilities in Holland, France and the United States. (See Figures 7-15 through 7-35.)

#### 7.4.3 New Plants

Recently ITT opened a new automotive plant in Culpeper, Virginia. The plant makes disc brake caliper assemblies for Alfred Teves and shock absorbers for Koni. The plant is undergoing a substantial expansion. ITT Suspension Systems Division has planned a plant for Macon, Georgia. The plant will be used to make MacPherson struts for front-wheel-drive vehicles.

Company ITT- Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Gifhorn Plant Congressional District \_\_\_\_\_

Address Alfred-Teves-Strasse Standard Metropolitan \_\_\_\_\_ No. of Employees 3,994  
3170 Gifhorn Statistical Area  
West Germany

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| N.C.A.                | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-15. GIFHORN PLANT



Company ITT- Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Rheinböllerrhutte Plant Congressional District \_\_\_\_\_

Address 6542 Rheinbölllen Standard Metropolitan \_\_\_\_\_ No. of Employees 1,389  
West Germany Statistical Area \_\_\_\_\_

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)              | Capacity | Processes Used | Consumed by (Automotive) |
|------------------------------------|----------|----------------|--------------------------|
| Incorporates disc brake<br>foundry | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-16. RHEINBÖLLERHUTTE PLANT

Company ITT - Alfred Leves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Central Administration Congressional District  
and Frankfurt Plant

Address Guerickestrasse 7 Standard Metropolitan \_\_\_\_\_ No. of Employees 2,353  
6000 Frankfurt 90 Statistical Area \_\_\_\_\_  
West Germany

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| N.C.A.                | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-17. FRANKFURT PLANT

Company ITT-Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Metallwarenfabrik Congressional District \_\_\_\_\_  
GmbH and Co. OHG

Address Müllerstrasse 4-14 Standard Metropolitan \_\_\_\_\_ No. of Employees 1,975  
5275 Bergneustadt Statistical Area \_\_\_\_\_  
West Germany

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_ :

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Engine sumps<br>Safety bumpers<br>Center pillars<br>Wheel hubs, and<br>embellishers<br>Radiator cowls<br>Body parts<br>Vehicle chassis | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-18. METALLWARENFABRIK PLANT

Company ITT- Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Hydraulics Division Congressional District \_\_\_\_\_

Address Rebstocker Strasse Standard Metropolitan \_\_\_\_\_ No. of Employees 341  
41-53 Statistical Area  
6000 Frankfurt 1  
West Germany

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Hydraulic pumps<br>Motors<br>Valves<br>Cylinders<br>Wheels<br>Brakes | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-19. HYDRAULICS DIVISION PLANT

Company ITT- Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Alfred Teves Mechelen Congressional District \_\_\_\_\_

Address General de Witte- Standard Metropolitan \_\_\_\_\_ No. of Employees 233  
laan 5 Statistical Area \_\_\_\_\_  
B-2800 Mechelen  
Belgium

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| N.C.A.                | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-20. MECHELEN PLANT

Company ITT - Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Alfred Teves Ltd. Congressional District \_\_\_\_\_

Address Wau-y-Pound Standard Metropolitan \_\_\_\_\_ No. of Employees 181  
Industrial Estate  
Ebbw Vale, South Wales

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| N.C.A.                | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-21. ALFRED TEVES LTD. PLANT

Company ITT- Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Alfred Teves France Congressional District \_\_\_\_\_

Address Zone Industrielle de-Gretz-Armain-villiers Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 115

Touman en Brie  
France

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| N.C.A.                | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-22. ALFRED TEVES FRANCE PLANT

Company ITT- Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Galfer SpA Barge Congressional District \_\_\_\_\_

Address Franzione San Martino 87 Standard Metropolitan \_\_\_\_\_ No. of Employees 197  
I-12032 Statistical Area  
Barge, Cuneo Italy

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| N.C.A.                | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-23. GALFER PLANT



Company ITT- Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Alfred Teves do Brasil Congressional District \_\_\_\_\_

Address Industria e Comercio Ltd Standard Metropolitan No. of Employees 635  
Avenida 21 de Marco S/No Statistical Area  
Varsea Paulista (S.P.)  
Brazil

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive) | Capacity | Processes Used | Consumed by (Automotive) |
|-----------------------|----------|----------------|--------------------------|
| N.C.A.                | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-24. ALFRED TEVES DO BRASIL PLANT

Company ITT - Alfred Teves County \_\_\_\_\_ Plant Size \_\_\_\_\_

Plant Culpeper Congressional District \_\_\_\_\_

Address P. O. Box 40 Standard Metropolitan \_\_\_\_\_ No. of Employees 170  
Culpeper, Virginia  
22701  
Statistical Area

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)         | Capacity | Processes Used | Consumed by (Automotive) |
|-------------------------------|----------|----------------|--------------------------|
| Disc brake caliper assemblies | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-25. CULPEPER PLANT

Company ITT-IAO County \_\_\_\_\_ Plant Size 57,000 sq. meters

Plant Way Assauto Congressional District \_\_\_\_\_

Address Asti, Italy Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 2,300

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                                    | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| McPherson Struts<br>Shock absorbers<br>Suspension bushes | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-26. WAY ASSAUTO PLANT

Company ITT-IAO County \_\_\_\_\_ Plant Size 28,000 sq. meters

Plant Altissimo Congressional District \_\_\_\_\_

Address Moncalieri Standard Metropolitan \_\_\_\_\_ No. of Employees 840  
Turin, Italy Statistical Area \_\_\_\_\_

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Vehicle indicators<br>Side and stoplight<br>assemblies<br>Driving mirrors | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-27. ALTISSIMO PLANT

Company ITT-IAO County \_\_\_\_\_ Plant Size 8,500 sq. meters

Plant D.P.A. Congressional District \_\_\_\_\_

Address Monale Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
near Asti, Italy Statistical Area

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)                                  | Capacity | Processes Used | Consumed by (Automotive) |
|--|----------|----------------|--------------------------|
| Vehicle indicators<br>Side and stoplight<br>assemblies | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-28. D.P.A. PLANT

Company ITT-IAO County \_\_\_\_\_ Plant Size 19,000 sq. meters

Plant Descam Congressional District \_\_\_\_\_

Address Lazzate Standard Metropolitan \_\_\_\_\_ No. of Employees 400  
near Milan, Italy Statistical Area \_\_\_\_\_

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)               | Capacity | Processes Used | Consumed by (Automotive) |
|-------------------------------------|----------|----------------|--------------------------|
| Vehicle exhaust units and silencers | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-29. DESCAM PLANT

Company ITT-IAO County \_\_\_\_\_ Plant Size 1- 21,500 sq. meters  
Gallino Plants 1-5 Congressional District \_\_\_\_\_  
 2- 18,000 sq. meters  
 3- 5,000 sq. meters  
 4- 23,000 sq. meters  
 5- 15,000 sq. meters

Address Turin (1-3) Standard Metropolitan 1,300  
Naples (4) Statistical Area (Turin plants only)  
Barcelona (5)  
 Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Steering Wheels<br>Fascia panels<br>Interior trim<br>Radiator grilles<br>Seats<br>Sun-visors<br>Plastic seals | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-30. GALLINO PLANTS

Company ITT-IAO County \_\_\_\_\_ Plant Size 14,000 sq. meters

Plant Sirtal Congressional District \_\_\_\_\_

Address Bruino (Turin) Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 350

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)         | Capacity | Processes Used | Consumed by (Automotive) |
|-------------------------------|----------|----------------|--------------------------|
| Window seals<br>Door channels | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-31. SIRTAL PLANT



Company ITT-IAO County \_\_\_\_\_ Plant Size 23,000 sq. meters

Plant Ulma Congressional District \_\_\_\_\_

Address Beinasco (Turin) Standard Metropolitan 400  
Statistical Area

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)            | Capacity | Processes Used | Consumed by (Automotive) |
|----------------------------------|----------|----------------|--------------------------|
| PVC trim<br>Stainless steel trim | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-32. ULMA PLANT

Company ITT- IAO County \_\_\_\_\_ Plant Size 3,000 sq. meters

Plant Hellebore Congressional District \_\_\_\_\_

Address Serravalle Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
(Ferrara, Italy) Statistical Area

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)        | Capacity | Processes Used | Consumed by (Automotive) |
|------------------------------|----------|----------------|--------------------------|
| Exhaust systems<br>Silencers | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-33. HELLEBORE PLANT

Company ITT-IAO County \_\_\_\_\_ Plant Size 23,000 sq. meters

Plant Fispa Congressional District \_\_\_\_\_

Address Beinasco (Turin) Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 300

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Electric/mechanical<br>fuel pumps<br>Oil and air filters<br>Pressure gauges | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-34. FISPA PLANT

Company ITT-IAO County \_\_\_\_\_ Plant Size 7,000 sq. meters

Plant Ind. Riunite GmbH Congressional District \_\_\_\_\_

Address Ubach Palenberg Standard Metropolitan \_\_\_\_\_ No. of Employees \_\_\_\_\_  
West Germany Statistical Area

Telephone \_\_\_\_\_ Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)        | Capacity | Processes Used | Consumed by (Automotive) |
|------------------------------|----------|----------------|--------------------------|
| Exhaust Systems<br>Silencers | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 7-35. IND. RIUNITE PLANT

## 7.5 FINANCIAL STATUS

ITT has shown steady earnings growth (excluding a non-recurring charge in 1979) and a conservative capital structure over the last five years.

### 7.5.1 Operations Analysis

ITT has had a steady, though mild, decline in its ratio of operating income to sales over the last five years. (See Figure 7-36). Nevertheless, the company's earnings, return on equity and return on sales all rose from 1976-1978. One important reason for this was a decline in the effective tax rate of the company in this period.

Sales in 1979 continued to increase. However, earnings declined by over 40 percent due to a major write-off of a pulp mill in Quebec. The mill was built in the '70s on the St. Lawrence River well north of Quebec and was destined to produce pulp for ITT's Rayonier Division. However, the mill was troubled by engineering problems, labor problems, the high cost of harvesting wood and a poor market for cellulose and rayon. ITT's board voted unanimously in September 1979 to close the mill and take a \$320 million write-off.

Stock analysts are optimistic about 1980 earnings for ITT. Progress is expected from telecommunications equipment, communications, industrial products, components, food, Sheraton Hotels and energy products. Automotive operations are expected to be weak due to decreased OEM sales. ITT is seen as having a mix of profitable and unprofitable operations and is expected to continue eliminating unprofitable operations.

### 7.5.2 Capital Analysis

ITT has been constant in its management of capital over the last five years. (See Figure 7-37.) Major equity changes have been connected with acquisitions and debt has increased at a moderate rate so that the overall capital structure of the firm as reflected in the ratio of long-term debt to capitalization has not varied significantly. It was ITT's stated goal over the last five years to manage its debt conservatively and improve the financial strength of the company. However, the company's stock price has changed little since 1976 and the company is trying to find other ways of improving this performance.

| Year | Sales<br>(\$Millions) | Earnings<br>(\$Millions) | Return on<br>Equity, Percent | Operating Income*<br>Sales | Percent |
|------|-----------------------|--------------------------|------------------------------|----------------------------|---------|
| 79   | 17,197                | 381                      | 7.8                          | 9.6                        |         |
| 78   | 15,261                | 662                      | 15.8                         | 10.1                       |         |
| 77   | 13,146                | 562                      | 14.0                         | 10.2                       |         |
| 76   | 11,764                | 489                      | 14.2                         | 10.3                       |         |
| 75   | 11,368                | 398                      | 11.9                         | 10.7                       |         |
| 74   | 11,154                | 541                      | 14.8                         | 11.0                       |         |

| Year | Earnings<br>Total Assets | Percent | Sales<br>Assets | Earnings<br>Sales | Percent |
|------|--------------------------|---------|-----------------|-------------------|---------|
| 79   | 2.6                      |         | 1.18            | 2.2               |         |
| 78   | 4.9                      |         | 1.14            | 4.3               |         |
| 77   | 4.6                      |         | 1.07            | 4.3               |         |
| 76   | 4.6                      |         | 1.10            | 4.2               |         |
| 75   | 3.8                      |         | 1.09            | 3.5               |         |
| 74   | 4.3                      |         | 1.08            | 4.0               |         |

\*Operating Income = Sales - Cost of Goods Sold - Selling, General and Administrative Expenses, Before Depreciation, Interest, and Income Taxes.

FIGURE 7-36. ITT OPERATIONS ANALYSIS

## Sources

| Year | Sources |                        |          |              |                           |  |
|------|---------|------------------------|----------|--------------|---------------------------|--|
|      | Sales   | P/E Ratio <sup>1</sup> | Earnings | Depreciation | Changes in Long-Term Debt | Changes in Owners' Equity Other Than Retained Earnings |
| 79   | 17,197  | 12-9                   | 381      | 454          | 92                        | 62   |
| 78   | 15,261  | 7-6                    | 662      | 424          | 522                       | (3)  |
| 77   | 13,146  | 9-7                    | 562      | 370          | 55                        | 268  |
| 76   | 11,764  | 9-6                    | 489      | 317          | 123                       | 56   |
| 75   | 11,368  | 8-5                    | 398      | 293          | 172                       | (67)   |
| 74   | 11,154  | 8-3                    | 451      | 296          | (107)                     | (8)  |

## Uses

| Year | Uses                      |                      |           |  |                       |                          | Current Ratio |
|------|---------------------------|----------------------|-----------|--|-----------------------|--------------------------|---------------|
|      | Change in Working Capital | Capital Expenditures | Dividends | Long-Term Debt <sup>2</sup> Capitalization % | Coverage <sup>3</sup> | Cap. Exp. Total Assets % |               |
| 79   | 73                        | 1,027                | 328       | 32.2   | 3.2                   | 7.1                      | 1.4           |
| 78   | 194                       | 925                  | 293       | 32.0   | 3.7                   | 7.0                      | 1.4           |
| 77   | 23                        | 803                  | 263       | 29.0   | 2.8                   | 6.9                      | 1.5           |
| 76   | 222                       | 618                  | 223       | 30.9   | 3.7                   | 5.8                      | 1.5           |
| 75   | 302                       | 516                  | 213       | 31.3   | 3.4                   | 4.9                      | 1.5           |
| 74   | 72                        | 806                  | 206       | 30.1   | 3.3                   | 7.7                      | 1.3           |

Dollar figures are in millions

<sup>1</sup> Range for the year<sup>2</sup> Capitalization Defined as Total Liabilities - Current Liabilities<sup>3</sup> Operating Profit/Interest

FIGURE 7-37. ITT CAPITAL ANALYSIS

Capital expenditures for ITT over the last five years have varied but are now at record levels. The company has been divesting some of its European operations and increasing its U.S. investment.

ITT appears to have no capital difficulties at present, and its automotive businesses are in a position to benefit from the expected support ITT will be giving to the automotive area in the '80s.

#### 7.6 RESEARCH AND DEVELOPMENT

ITT research and development is centrally coordinated from New York and is carried out in engineering facilities at most manufacturing divisions and subsidiaries and in major research centers in the United States, Belgium, France, Germany, Great Britain, Italy and Spain. In 1980 research and development expenditures are expected to be over \$1 billion of which half will be ITT funds and the balance will be customer funded research and development.

#### 7.7 GOVERNMENT RELATIONS

ITT has recently had dealings involving the government in two areas: antitrust litigation and improper corporate conduct allegations. These are discussed below.

##### 7.7.1 Antitrust

In early 1980, ITT and the American Telephone and Telegraph Company (AT&T) reached an agreement that led ITT to drop its \$150 million antitrust suit, filed in 1977 against AT&T. The suit charged AT&T and its Western Electric and Bell Laboratories subsidiaries with combining to discriminate against ITT as a supplier of telephone equipment.

The agreement requires AT&T to put \$200 million on deposit with ITT to be held against future purchases of as much as \$2 billion in telecommunications products and services over the next ten years from the company. The agreement also specifies that the two companies would work toward adopting an ITT central switching system, currently in use in Europe, to Bell System requirements.

The announcement comes during a period of intense antitrust litigation for AT&T, including a case arising from Justice Department antitrust charges. Analysts have



suggested that AT&T may have felt the legal pressure to clear the case out of its way.

#### 7.7.2 Corporate Conduct

In response to published disclosures of business practices by certain United States corporations, ITT's board of directors in 1975 carried out a special review of ITT's operations from 1971 to 1975. The board revealed that at times ITT had made payments to government functionaries in order to expedite administrative action or secure procedural assistance. The board also stated that it had now adopted policies forbidding such practices and established procedures to monitor compliance.

In late 1978 there became publicly available a complaint filed on May 4, 1978, by the Securities and Exchange Commission alleging failure on the part of ITT to disclose the unlawful or questionable use of certain corporate funds and failure to disclose and properly account for certain political contributions in Chile. Among other things, the complaint requests the appointment of new directors who have had no prior affiliation, association or financial dealings with ITT. ITT feels any further disclosures are not required by law and would be immaterial to investors, and is thus opposing the SEC action.



## 8. A. O. SMITH

A. O. Smith, founded in 1874, is a family-controlled company that is the world's largest independent manufacturer of automotive and truck frames, producing approximately four million frames annually. Sales of the firm's Automotive Division account for over half of total sales, and over half of those sales are to General Motors (GM). Other divisions of the company produce electric motors, water heaters, agricultural storage systems, reinforced plastic pipe and computer systems. Over the past several years, the company has focused its efforts on improving its position in non-automotive markets. It would like to develop a better balance among its product lines.

The frame business is closely tied to the original equipment (OEM) automotive market. Thus, A. O. Smith's sales have been hurt by the downturn in auto sales and further affected by the market shift toward smaller vehicles. The faster-selling, smaller passenger cars such as the GM X-body have been designed with integral frames rather than the separate frames that have been the mainstay of A. O. Smith's automotive business. The company is attempting to adjust to these developments by diversifying the firm's operations and by trying to demonstrate to General Motors that separate frames can offer advantages over integral frames with no added weight or cost. However, the announced product plans of GM and Chrysler indicate a shift to front wheel drive unibody cars (integral frames), which indicates that A. O. Smith's separate frame business may be a victim of auto re-design for fuel efficiency.

### 8.1 CORPORATE SIZE AND STRUCTURE

A. O. Smith was incorporated in 1916 and has been controlled throughout its history by the Smith family. The Smith Investment Company, a family holding company, owns about 54 percent of the common stock. Among major suppliers of automobile parts, A. O. Smith ranks tenth in revenues and eleventh in net income.

#### 8.1.1 Revenue, Profit and Employment Statistics

A. O. Smith's 1979 sales were \$836 million, up from \$806 million in 1978. Income rose to \$29.6 million in 1979, as compared to \$27.0 million in the prior year. The company employed about 13,000 persons in 1979 and labor costs were approximately 30 percent of total sales (see Table 8-1).

TABLE 8-1. A. O. SMITH  
REVENUES, PROFIT AND EMPLOYMENT

| Year                                       | Revenues<br>(Millions) | Profits<br>(Millions) |
|--|------------------------|-----------------------|
| 1979                                       | \$836.4                | \$23.6                |
| 1978                                       | 806.5                  | 27.0                  |
| Average Number of Employees: 12,700 (1979) |                        |                       |

### 8.1.2 Corporate Organization

A. O. Smith is divided into six divisions by product group. (See Figure 8-1). The divisions, roughly in order of size, are as follows:

- The Automotive Division manufactures cars, truck and bus frames, and other auto components in Milwaukee, Wisconsin and Granite City, Illinois, and has recently opened a plant in Milan, Tennessee. The division also produces railroad brake beams, running boards and other parts for rail cars.
- The Electric Motor Division produces a variety of fan and blower motors and jet pump motors. Fan and blower motors are used in heating and air conditioning systems while jet pump motors are used for water movement such as in home water systems and swimming pools.
- The Consumer Products Division operates five plants in the U.S., Canada and the Netherlands that manufacture gas, electric and oil residential and commercial water heaters, several types of boilers, and glass-lined storage tanks.
- The Glass Coating Division in Milwaukee produces protective coating for alloy steel processing and glass frits for corrosion protection in water heaters and storage tanks.
- The Data Systems Division in Milwaukee provides software and hardware computer services for manufacturing, engineering and commercial applications.
- The Product Service Division, based in Chicago, handles warranty service and replacement parts.

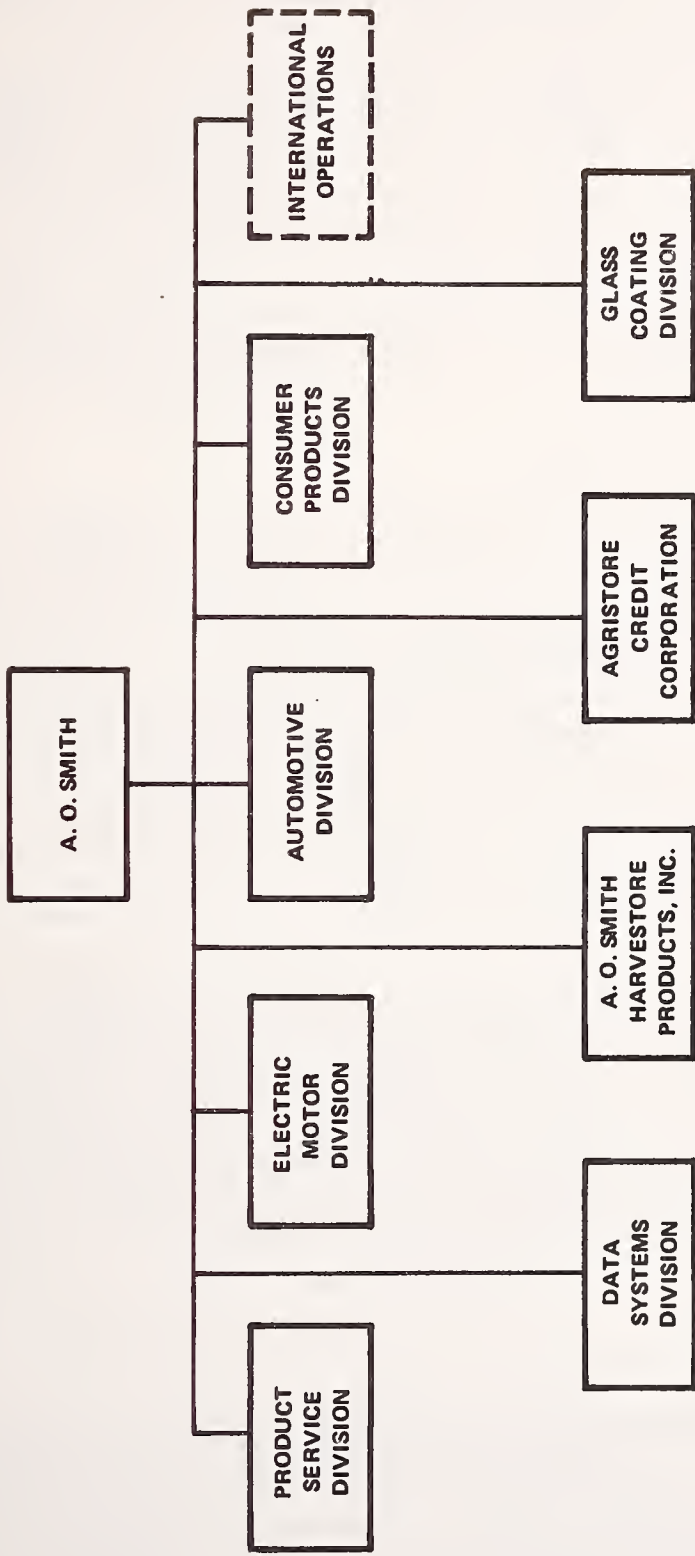


FIGURE 8-1-1. A. O. SMITH CORPORATE ORGANIZATION

- The Hermetic Motor Division produces motors sealed inside compressors used in air conditioning and refrigeration systems. These motors are composed essentially of a rotor and stator. This division was formed in April 1979.

A. O. Smith also has several subsidiaries, including A. O. Smith Harvestore Products, Inc., which makes animal feed processing and storage systems, and Agristore Credit Corporation, which is a finance and insurance company. Several overseas companies are affiliated with A. O. Smith. The affiliate with closest connections to the auto industry is Manufacturas Metalicas Monterrey, S.A., in Monterrey, Mexico, which makes frames, chassis components, structural stampings, and assemblies.

## 8.2 MAJOR MARKETS AND PRODUCTS

Figure 8-2 presents a summary of the major market information for A. O. Smith.

| <u>MARKET DATA</u>  |  |
|---------------------|--|
| Major Markets:      | Passenger cars, trucks, buses, appliances, agriculture   |
| Percent of Sales to | Auto Industry: 53 percent  |
| Supplies to:        | General Motors, Chrysler   |
| Major Products:     | Car, truck, bus and trailer frames; automobile structural parts; bumper reinforcements; wheel suspension control arms; electric motors; water heaters; boilers; hot water storage tanks; agricultural storage systems; glass coatings; computer systems; reinforced pipe |

FIGURE 8-2. A. O. SMITH MARKET DATA

### 8.2.1 Major Markets

Historically, A. O. Smith's major markets are the car and truck industries. As shown above in Figure 8-2, over 50 percent of the firm's total sales are to the automotive industry. Table 8-2 shows a breakdown of sales by product group from 1974 to 1979. This table shows that the company is gradually diversifying into other product lines so that no one segment represents a disproportionate share of the whole. For example, over the last four years, automotive sales as a percent of total sales have declined from 60 percent in 1976 to 53 percent in 1979.

TABLE 8-2. SALES BREAKDOWN BY MAJOR  
PRODUCT GROUP, 1974 to 1979

| Product Group   | 1979 | 1978 | 1977 | 1976 | 1975 | 1974 |
|---|------|------|------|------|------|------|
| Automobile and Truck Frames                           | 53%  | 56%  | 60%  | 61%  | 58%  | 52%  |
| Electric Motors                                       | 14   | 13   | 12   | 12   | 11   | 14   |
| Water Heaters & Heating Equipment                     | 15   | 13   | 12   | 12   | 13   | 12   |
| Agricultural Storage, Handling<br>and Feeding Systems | 17   | 14   | 11   | 10   | 11   | 15   |

Almost all of the company's sales of passenger car frames are to General Motors. In 1978, GM accounted for more than 36 percent of A. O. Smith's total sales. The company's long-standing relationship with GM has helped it to achieve a significant share of both the passenger car and truck frame markets. The firm estimated that in 1978 it produced 39 percent of all full-length passenger car frames manufactured in the U.S. and Canada and 36 percent of all truck frames made in the two countries. Its primary competitors in these markets are the Dana Corporation, the Budd Company, Checker Motors and Midland Steel Products Company.

The customer base of the Automotive Division was broadened somewhat in 1979 with the announcement that A. O. Smith had won a contract to manufacture rear suspension assemblies for a Chrysler car to be released in the next two years. The company has built a new plant in Tennessee to handle the increased production volume and states in its 1978 annual report that the Chrysler contract is an example of "opportunities provided by new design concepts in resizing cars and trucks."

### 8.2.2 Products

A. O. Smith's major automotive products are full separate frames for passenger cars and trucks. Table 8-3 shows annual A. O. Smith production figures for car and truck frames from 1975 to 1979. Other products sold to the auto manufacturers include wheel suspension control arms for cars, trucks and buses and bumper reinforcements for passenger cars.

TABLE 8-3. ANNUAL CAR AND TRUCK  
FRAME PRODUCTION, 1975 TO 1979

| Year | Car Frames<br>(Millions) | Truck Frames<br>(Millions) |
|------|--------------------------|----------------------------|
| 1979 | 1.8                      | 1.1                        |
| 1978 | 2.2                      | 1.5                        |
| 1977 | 2.4                      | 1.7                        |
| 1976 | 2.3                      | 1.6                        |
| 1975 | 1.6                      | 1.2                        |

*Marketing Strategy*

A. O. Smith's approach to its automotive market is based on its many years of experience in manufacturing vehicle frames, its emphasis on continuing engineering improvements and its established relationship as a major supplier to GM. The company developed the first pressed steel auto frame at the turn of the century and since then has produced more than 90 million auto frames, 30 million truck frames and 60 million control arm sets. Among its technological innovations over the last 80 years, the company points in particular to its invention of the first continuous frame manufacturing factory. The firm is counting on its engineering efforts to prove to GM that separate frames are attractive alternatives to the integral bodies now being used in many of GM's downsized vehicles.

*New Product Plans*

In 1979, A. O. Smith released details of a new process that it is using to improve the corrosion resistance of the steel frames that it ships to auto and truck manufacturers. By adding a water-soluble acrylic-resin coating to the final solution in which the steel is dipped prior to forming, and by using barium hydroxide as a neutralizing agent, the firm can now leave formed and stamped frame parts in outdoor storage for up to 30 days without rusting. This means that an overproduction of parts at various areas in the continuous manufacturing line can be alleviated by simply storing the excess until it is needed, rather than shutting down the entire line. The company also reports that the changes in steel preparation have made the steel easier to stamp and form.



### 8.3 CORPORATE STRATEGY

A. O. Smith's corporate plans center on three objectives:

- Divestiture of less profitable sections of the company
- Diversification into and expansion of non-automotive areas
- Demonstration of the competitiveness of independent frames for smaller vehicles.

#### 8.3.1 Divestiture

Between 1975 and 1977, A. O. Smith sold several sections of its business that were doing poorly. In 1975, the firm sold two wholly-owned subsidiaries, Armor Elevator Canada, Ltd., and Bull Motors, Ltd., ending the company's involvement in the elevator industry. In 1976, the firm's Meter Systems business was sold. The following year, A. O. Smith and Inland Steel agreed to discontinue the powder metallurgy operations of a company that they own jointly, A. O. Smith-Inland, Inc. In a recent annual report, the firm told its stockholders, "We believe the decisions we made in prior years to divest ourselves of a number of businesses and to concentrate on the markets and products we know best are proving to be correct...Our major goals in the years ahead will be to improve our average return on shareholder's equity and reduce our cyclicity."

#### 8.3.2 Diversification

Diversification efforts are aimed at decreasing the company's dependence on the auto frame market. The new Chrysler contract for rear suspension assemblies is one example of this strategy. Another is the company's announcement in 1979 that it had purchased a 10-year-old plant near McBee, South Carolina, for manufacturing water heaters. Heater manufacturing capacity will increase by an estimated 50 percent when full production at the new plant is reached. By late 1980 or early 1981, manufacturing should be underway on solar, gas and electric tank-type heaters. In another expansion effort, the company purchased a 205,000-square foot plant near Mebane, North Carolina, in 1978 to augment the production capacity of its Electric Motor Division, which is currently generating the highest rate of return of the firm's divisions. The new facility will produce motors for the air conditioning industry.

### 8.3.3 Downsized Vehicle Demonstrations

The increasing proportion of downsized cars sold in the U.S. presents a serious threat to the market position of A. O. Smith. The company's automotive operations are built on the production of independent frames. The auto manufacturers, however, have shifted their smaller cars to integral or unitized frames in an effort to reduce the weight, cost, and fuel consumption of the vehicles. General Motors, the company's primary customer for passenger car frames, is using A. O. Smith frames only for its intermediate and full-size models.

In order to win back some of the orders being lost, A. O. Smith has undertaken a major engineering project to demonstrate the viability of their products for the smaller cars. Company engineers and designers have rebuilt existing downsized cars using independent frames. They have publicized results showing that the independent frame cars rode more smoothly, were quieter and did not cost or weigh more than their integral frame counterparts. Company spokesmen stress that their frames provide the quality of ride and comfort that American car buyers are looking for.

## 8.4 PRODUCTION AND OPERATIONS

The Automotive Division operates factories in three locations: Milwaukee, Wisconsin; Granite City, Illinois; and Milan, Tennessee. (See Figures 8-2, 8-3, and 8-4.)

### Milwaukee, Wisconsin

The facility in Milwaukee, Wisconsin, employs 3,000 people, covers 190,000 square feet and produces approximately 1.5 million passenger car frames annually. Operations performed at the plant include stamping, forming and finishing. The output of the facility is sold almost exclusively to divisions of General Motors. The company spent \$5 million in 1979 to expand the plant, enlarging it by 68,000 square feet to house a press shop and additional research laboratories.

### Granite City

The plant in Granite City, Illinois, also produces passenger car frames for General Motors. The factory employs 1,600 people, covers 78,000 square feet and produces one million frames per year. Operations performed at the facility include stamping, forming, assembly and finishing.

Company A. O. Smith County \_\_\_\_\_ Plant Size 190,000 sq ft

Plant Milwaukee Congressional District \_\_\_\_\_

Address 3533 North 17th St. Standard Metropolitan No. of Employees 2,000  
Milwaukee, WI 53201 Statistical Area

Telephone (414) 447-4000 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)           | Capacity                                | Processes Used                               | Consumed by (Automotive)            |
|---------------------------------|---|--|-------------------------------------|
| Automotive passenger car frames | 1,500,000 passenger car frames annually | Stamping, forming, finishing (rust-proofing) | General Motors (almost exclusively) |

FIGURE 8-3. MILWAUKEE PLANT DATA

Company A. O. Smith County \_\_\_\_\_ Plant Size 78,000 sq ft

Plant Granite City Congressional District \_\_\_\_\_

Address Highway 3 North Granite City, IL 62040 Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 1,600

Telephone (618) 452-2100 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)       | Capacity                                | Processes Used   | Consumed by (Automotive)            |
|-----------------------------|---|--|-------------------------------------|
| Automotive passenger frames | 1,000,000 passenger car frames annually | Stamping, forming, assembly, finishing (rust-proofing) | General Motors (almost exclusively) |

FIGURE 8-4. GRANITE CITY PLANT DATA

Company A. O. Smith County \_\_\_\_\_ Plant Size 416,000 sq ft

Plant Milan Congressional District \_\_\_\_\_

Address P.O. Box 529 Standard Metropolitan 1,700  
Milan, TN 38358 Statistical Area

Telephone (901) 686-0891 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)      | Capacity | Processes Used                               | Consumed by (Automotive)                                      |
|----------------------------|----------|--|---|
| Rear suspension components | N.C.A.   | Stamping, forming, finishing (rust-proofing) | Primarily to Chrysler with increasing sales to General Motors |

FIGURE 8-5. MILAN PLANT DATA

## Milan, Tennessee

At the beginning of 1980, A. O. Smith opened a new plant in Milan, Tennessee. The factory was built during 1979 to provide the company with the capacity to meet Chrysler orders for rear suspension components. The components will be incorporated in a new car that Chrysler will unveil within the next two years. The plant covers 416,000 square feet and will employ 1,700 people when it reaches full production toward the middle of 1980.

### 8.5 FINANCIAL STATUS

In 1976, A. O. Smith began to shake off the effects of several unprofitable acquisitions purchased in the late '60s and divested in 1974 and 1975. In 1978, the company achieved record sales and earnings. Now, however, it must face the effects of the auto slump and the shift away from independent frames.

#### 8.5.1 Operations Analysis

In 1978, A. O. Smith attained record sales of \$807 million, achieved its best earnings-per-share ratio and paid its largest cash dividend. (See Figure 8-5.) Earnings, unencumbered by a major model changeover in the Automotive Division and spurred by strong demand in the agricultural market, jumped 63 percent from the prior year to \$27 million. Return on equity rose sharply to 14 percent, and the percentages of operating income to sales and earnings to total assets also climbed.

The company is having difficulty maintaining this momentum, however. Due to a serious drop in sales in the fourth quarter, 1979 sales increased only 3 percent over 1978, to \$836 million.

Investment analysts are pessimistic about the firm's prospects for 1980. They are, however, encouraged by the company's diversification efforts and the divestiture of marginal businesses, and they are generally predicting a healthy recovery once the company weathers the current storm in the automotive market.

A. O. Smith has announced that by 1983, a decline of up to 75 percent in volume is expected in its sales of passenger car frames to auto manufacturers as compared to 1979 results. This estimate was made from its understanding of General Motors' product plans over the next several years.

| Year | Sales<br>(\$Millions) | Earnings<br>(\$Millions) | Return on<br>Equity, Percent | Operating Income*<br>Sales | Percent |
|------|-----------------------|--------------------------|------------------------------|----------------------------|---------|
| 79   | 836                   | 29.6                     | 14.0                         | 7.9                        |         |
| 78   | 807                   | 27.0                     | 14.0                         | 8.5                        |         |
| 77** | 727                   | 16.6                     | 9.5                          | 6.2                        |         |
| 76** | 619                   | 15.6                     | 9.7                          | 7.4                        |         |
| 75** | 452                   | 4.1                      | 2.5                          | 3.8                        |         |
| 74   | 568                   | 0.5                      | 0.3                          | 2.7                        |         |

| Year | Earnings<br>Total Assets | Percent | Sales<br>Assets | Earnings<br>Sales | Percent |
|------|--------------------------|---------|-----------------|-------------------|---------|
| 79   | 7.4                      |         | 2.1             | 3.5               |         |
| 78   | 7.2                      |         | 2.2             | 3.3               |         |
| 77   | 4.7                      |         | 2.0             | 2.3               |         |
| 76   | 4.7                      |         | 1.9             | 2.5               |         |
| 75   | 1.2                      |         | 1.3             | 0.9               |         |
| 74   | 0.1                      |         | 1.0             | 0.1               |         |

\*Operating Income = Sales - Cost of Goods Sold - Selling, General and Administrative Expenses, Before Depreciation, Interest, and Income Taxes.

\*\*Excludes discontinued operations.

FIGURE 8-6. A.O. SMITH OPERATIONS ANALYSIS

### 8.5.2 Capital Analysis

The company's long-term debt decreased steadily between 1974 and 1979. Owners' equity other than retained earnings over the same five-year period increased only slightly, and the percentage of long-term debt to capitalization declined from 29 percent in 1975 to 14 percent in 1979. The firm has undertaken some capital expenditures in connection with its diversification strategy, but all of the expansion programs have been financed internally. The coverage ratio climbed significantly between 1974 and 1979, although the current ratio declined to 1.7 in 1979. The company and investment analysts are agreed that the projected capital spending programs can proceed without recourse to outside sources of funds. (See Figure 8-6.)

### 8.6 RESEARCH AND DEVELOPMENT

As of 1978, A. O. Smith employed 370 people in engineering, research and development programs directed at development of new and improved products, materials and manufacturing processes. Total expenditures for engineering, research and development for 1978 and 1977 were approximately \$15,366,000 and \$12,767,000, respectively. A considerable but unspecified portion of the research and development efforts is directed at demonstrating the feasibility of designing smaller, fuel-efficient passenger cars with independent frames.

### 8.7 GOVERNMENT RELATIONS

In 1979, A. O. Smith agreed to settle a class action suit made against it for \$6,350,000. The claims arose from a Federal charge that the company had engaged in price fixing in the water heater industry. In a prior action, the Federal District Court in Philadelphia fined the firm \$350,000 after it pleaded "no contest" to the price fixing charges. The costs of the fine and settlement resulted in a special charge to stockholders of \$1.22 a share in the second quarter of 1979.



## Sources

| Year | Sales | P/E Ratio <sup>1</sup> | Earnings | Depreciation | Changes in     |                | Changes in Owners' Equity Other Than Retained Earnings |
|------|-------|------------------------|----------|--------------|----------------|----------------|--|
|      |       |                        |          |              | Long-Term Debt | Long-Term Debt |  |
| 79   | 836   | 4.0-3.0                | 29.6     | 19.2         | 1.4            |                | (0.3)  |
| 78   | 807   | 4.5-2.5                | 27.0     | 17.4         | (7.7)          |                | 0.3  |
| 77   | 727   | 5.2-3.9                | 16.6     | 14.0         | (14.6)         |                | 2.2  |
| 76   | 619   | 5.7-2.8                | 15.6     | 12.4         | (4.8)          |                | 1.6  |
| 75   | 452   | 13.3-8.7               | 4.0      | 13.4         | (1.8)          |                | 0  |
| 74   | 568   | 145.0-                 | 0.5      | 12.1         | (4.2)          |                | (0.4)  |
|      |       | 61.3                   |          |              |                |                |  |

## Uses

| Year | Change in Working Capital | Capital Expenditures |           | Dividends | Long-Term Debt <sup>2</sup> Capitalization | Coverage <sup>3</sup> | Cap. Exp. Total Assets % | Current Ratio |
|------|---------------------------|----------------------|-----------|-----------|--|-----------------------|--------------------------|---------------|
|      |                           | Expenditures         | Dividends |           |  |                       |                          |               |
| 79   | (12)                      | 41.2                 | 6.9       | 14.0      | 17.9                                       | 10.3                  | 1.7                      |               |
| 78   | 7.1                       | 29.7                 | 5.6       | 14.4      | 18.2                                       | 8.0                   | 1.8                      |               |
| 77   | (14.5)                    | 34.3                 | 4.2       | 18.0      | 9.5  | 11.4                  | 1.9                      |               |
| 76   | 12                        | 16.2                 | 3.4       | 24.0      | 7.5  | 4.9                   | 2.1                      |               |
| 75   | (0.2)                     | 15.4                 | 3.2       | 28.6      | 2.2  | 4.6                   | 2.3                      |               |
| 74   | (23.1)                    | 28.9                 | 3.8       | 26.2      | 1.9  | 8.4                   | 1.9                      |               |

Dollar figures are in millions

<sup>1</sup> Range for the year<sup>2</sup> Capitalization Defined as Total Liabilities - Current Liabilities<sup>3</sup> Operating Profit/Interest

FIGURE 8-7. A.O. SMITH CAPITAL ANALYSIS



## 9. TRW

TRW is a major North American and international supplier of OEM automobile engine and steering components. The company is also an important aftermarket supplier. TRW has been making rack and pinion steering systems for European cars for many years and is now expanding capacity to supply the new needs of downsized American cars for these systems. In addition, the company is attempting to capitalize on the need for new bearings in front-wheel-drive cars and the growing use of electronic engine controls. TRW feels that a strong technology base is important for its products and hopes to continue to use its technological expertise to create new products for the automobile industry.

### 9.1 CORPORATE SIZE AND STRUCTURE

TRW was formed in 1958 with the merger of Thompson Products, a major producer of valves and other automotive products, with Ramo-Wooldridge Corporation, a leader in technology for Air Force ballistic missile programs. The company today is large and diversified and is still an important supplier of car and truck products worldwide. More than one-third of TRW's sales are in these areas.

#### 9.1.1 Revenue, Profit and Employment Statistics

In 1979, TRW had sales of \$4.6 billion, up from \$3.8 billion in 1978. Profits increased from \$174 million to \$195 million. The company had about 98,000 employees in 1979. (See Table 9-1.)

TABLE 9-1. TRW REVENUE, PROFIT AND EMPLOYMENT STATISTICS

| Year                         | Revenues<br>(Millions) | Profits<br>(Millions) |
|------------------------------|------------------------|-----------------------|
| 1979                         | \$4,560                | \$195                 |
| 1978                         | \$3,787                | \$174                 |
| Average Number of Employees: |                        | 97,900 (1979)         |

In 1979, TRW Automotive Worldwide employed about 30,000 people in 64 plants and accounted for about 39 percent of TRW's sales.

### 9.1.2 Corporate Organization

TRW is organized into four major divisions: Systems and Energy, Automotive Worldwide, Industrial and Replacement, and Electronics. (See Figure 9-1.) The Systems and Energy Division includes energy systems, equipment and defense and space systems. Automotive Worldwide covers sales of automotive engine, steering, chassis, and general components. The Industrial and Replacement Division includes aftermarket operations, energy products and industrial products. The Electronics Division includes electronic components and information services.

Corporate staffs exist in finance, science and technology, communications and several other areas. The Automotive Worldwide Division has staff groups covering manufacturing, planning, control engineering and employee relations. Automotive Worldwide is subdivided into four operating groups corresponding to the four types of components mentioned above—engine, steering, chassis and general components.

## 9.2 MAJOR MARKETS AND PRODUCTS

Figure 9-2 summarizes the major market information for TRW.

| <u>MARKET DATA</u>                     |  |
|--|--|
| Major Markets:                         | Cars, trucks, off-highway vehicles, replacement parts, industrial and energy markets |
| Percent of Sales to the Auto Industry: | 39   |
| Supplies to:                           | General Motors, Ford   |
| Major Automotive Products:             | Steering systems, valves, pistons, pumps, seat belts                                 |

FIGURE 9-2. MARKET DATA FOR TRW

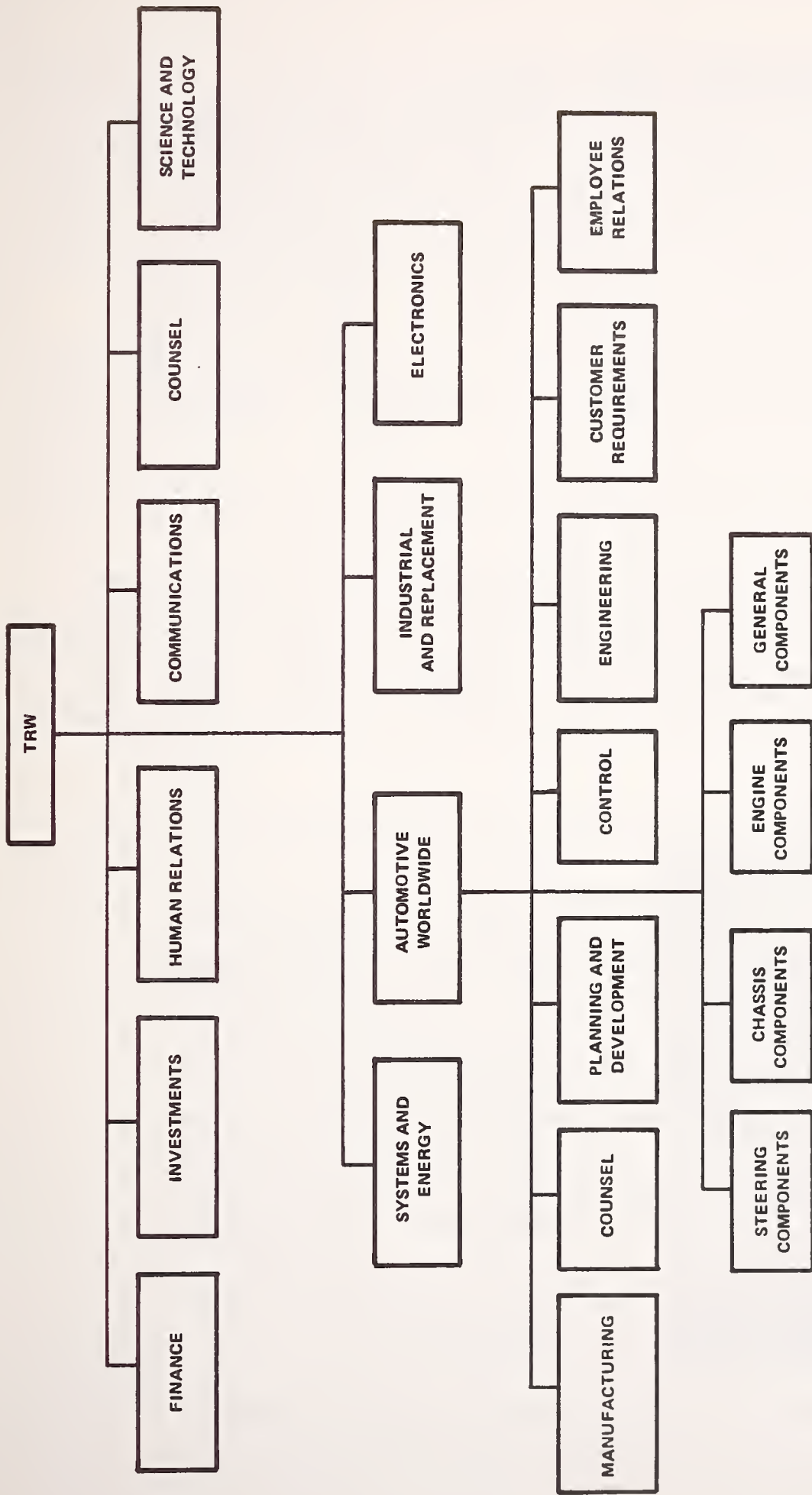


FIGURE 9-1. TRW CORPORATE ORGANIZATION

9.2.1 Major Markets

TRW's principal automotive markets include original equipment manufacturers of cars, trucks, and farm machinery and other off-highway vehicles. TRW sells car and truck products it manufactures as well as products purchased from other manufacturers to the replacement market. In addition, replacement parts manufactured by TRW are sold to original equipment manufacturers and others for resale through their own distribution networks. TRW's car and truck parts accounted for 39 percent of sales in 1979 and 44 percent of profits. (See Table 9-2.) Of the car and truck OEM sales, 59 percent was for automotive and 41 percent was for truck and off-highway vehicles. (See Figure 9-3.)

TABLE 9-2. TRW SALES AND PROFITS BY MARKET IN 1979

| Market Area               | Sales (%) | Profits (%) |
|---------------------------|-----------|-------------|
| Car and truck parts       | 39        | 44          |
| Electronics space systems | 33        | 20          |
| Industrial and energy     | 28        | 36          |

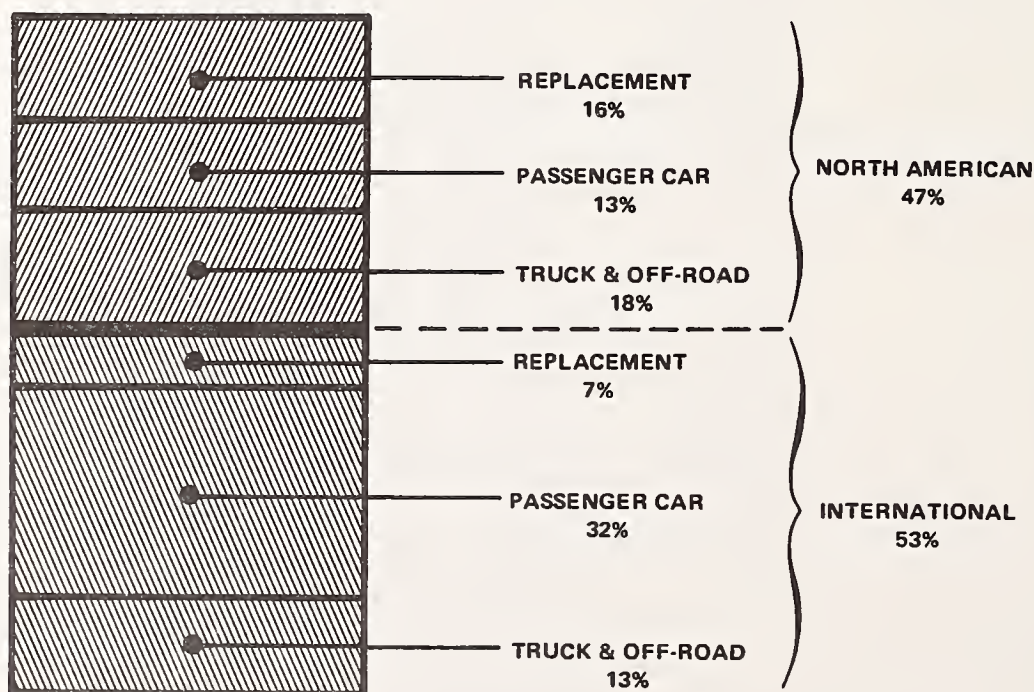


FIGURE 9-3. CAR AND TRUCK SALES BY MARKET\*

\* Based on 1978 total car and truck sales of \$1.6 billion.

Competitors for car and truck product markets include independent suppliers of parts and components as well as original equipment auto manufacturers who are often capable of producing their own parts. The markets characteristically have relatively few competitors and high capital and technological requirements. In the replacement market, competition includes distributors and mass merchandisers as well as original equipment auto manufacturers which produce and sell replacement parts through their own distribution systems.

In 1978 car and truck sales to General Motors and Ford represented 15 percent and 13 percent, respectively, of TRW's total sales of car and truck products. Overseas automotive sales are principally OEM passenger car parts, while North American sales are largely for truck, farm, construction and industrial customers. Although automotive components account for only 40 percent of TRW's net sales worldwide, sales to the automotive sector represent 90 percent of its total sales in Europe (about \$720 million in 1978).

TRW's electronics, space systems, industrial and energy markets include government customers (20 percent of TRW's total sales), retail and banking computer-system customers, the electronic component market, oil companies, power companies and the aircraft industry, and account for 60 percent of TRW's revenues.

### 9.2.2 Products

TRW's Automotive Worldwide Division manufactures products in three different categories:

- Engine Parts. TRW manufacturers engine parts such as valves, valve train components, pistons, piston pins, piston rings, water pumps and cylinder sleeves in a variety of locations. Valves, the principal product in this group are produced in Argentina, Australia, Brazil, Canada, France, Great Britain, Japan, Mexico, the United States and West Germany for the automotive industry as well as an array of applications beyond, such as in aircraft, marine, industrial and lawn mower engines. Valves are manufactured to specific requirements and include nickel chromium and other alloys.

Valve train components include rotators, spring retainers, locks, guides and caps.

Piston rings are supplied with scuff-free molybdenum face coatings as well as patented plasma powder alloy coatings for longer life.

- Chassis and Steering Components. TRW produces a broad range of chassis and steering components for passenger cars, trucks and off-highway equipment.

Suspension and steering joints and steering linkage are manufactured in 15 plants in ten countries outside the United States. These are: Argentina, Australia, Brazil, Canada, France, Great Britain, Japan, Spain, West Germany and Venezuela.

Included in this category are upper and lower suspension joints, tie rods and tie rod ends, pitman arms, idler arms, center links, drag links, radius and guide rods, rear-end suspension components and assemblies and shifter mechanisms.

Steering gears are manufactured in Australia, Brazil, France, Great Britain, Japan, Italy, the United States, Spain and South Africa. TRW has for a long time been an important supplier of steering mechanisms from its United Kingdom plants to the U.S. car industry.

Types of gears produced are manual and power rack and pinion and recirculating ball for passenger cars and light trucks, manual worm and roller, integral and semi-integral power gears for medium- and heavy-duty trucks, manual cam and lever as well as hydrostatic power systems for tractors and other off-highway vehicles where installation precludes a mechanical connection. Power steering pumps are manufactured in Brazil as well as the United States.

Steering columns are produced in Brazil, Great Britain and the United States.

High torque hydraulic motors are made in Brazil, Germany and the United States. These motors are used in a myriad variety of diverse applications such as machine tool drives, farm implements, car washes and greens mowers.



- General Components. This product grouping consists of seat belts, steering wheels, precision forgings, castings, stampings, brake shoes, and fasteners.

Seat belts are supplied from Germany and Austria to the European auto industry with additional production in Australia and South Africa.

Both rubber and plastic steering wheels are made in Great Britain primarily for British vehicle manufacturers.

Precision forgings include forged gears for the European truck, farm and other off-highway equipment manufacturers, axle forgings for the Australian market and other varieties of forging.

Fasteners are manufactured in Australia, Japan and Great Britain.

#### *New Product Plans*

The auto industry's program to manufacture smaller cars has led to several product developments at TRW.

- Rock and Pinion Steering. The company is now selling rack and pinion systems, which have been manufactured by TRW for European customers for over 30 years, to North American auto manufacturers. TRW is the leading independent supplier of both manual and power-assisted rack and pinion steering systems in the world. The company has designed a new power-assisted steering system for the North American market. Extensive testing is underway on systems using lighter weight and smaller components.
- Bearings. A TRW division has been working to market bearings for front-wheel-drive cars. Since most American cars have been using the same type of tapered bearing assembly on the front end for years, until recently there has not been much of a market for other bearing types. Now TRW has developed a ball bearing with a double roll and a cage made of plastic (reinforced nylon). Iron Age has indicated that the likely customer for the new ball bearing is Chrysler Corporation.\*

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\* "TRW Bearing Division Aims at Front-Wheel-Drive Market," Iron Age, May 21, 1979.

- Electronics. TRW has been focusing resources on transportation electronics. In 1978, the company established a new organization for transportation electronics to combine the company's strong capability in electronics and data communications systems with its capabilities in vehicle components. Today TRW supplies components and assemblies to the automotive electronics market and expects this market to grow rapidly. TRW is also developing electrohydraulic products for efficient performance of trucks and off-highway vehicles.

### *Sales Strategy*

TRW has recently had an aftermarket advertising campaign with the theme, "Most companies just sell engine parts. TRW invents them." The ads highlight TRW's automotive inventions over the years and emphasize that this development role means that TRW replacement parts are the highest quality possible. The company also emphasizes its fast delivery capability, using a nationwide network of 39 factory branches.

TRW also boasts of the durability and reliability of its products and their worldwide availability through coordinated engineering and marketing.

### 9.2.3 Marketing Strategy

TRW's marketing strategy includes three important points:

- High technology product developments
- Strong distribution organization
- Maintenance and customer support.

These are described below.

### *Product Developments*

TRW tries to exploit its technological capabilities by matching them to the needs of the marketplace. An example of this is the fluid power systems developed for the heavy-duty truck and off-highway equipment markets. These products are extensions of the technology used in TRW's power steering systems, a field where it has been a significant supplier for many years.

### *Distribution*

Providing automotive parts and supplies to the after-market is a complex business that has changed dramatically in the past several decades. In the early 1950s in the U.S., approximately 70 percent of all replacement parts were sold through car and truck dealers, whereas today this segment controls only 30 percent of the market with the independent service sector handling over 70 percent of all after-market sales. This change has greatly increased the task of meeting the needs of the warehouse distributors and jobbers who supply the independents. In addition, requirements for immediate availability of parts have intensified.

To provide a prompt service network, TRW has established a core distribution center in Cleveland and some 40 supporting factory branches throughout the U.S. Over 40,000 replacement parts are handled through this network, which has an integrated materials handling system and a computerized inventory control system. An engineering test laboratory also evaluates all types of automotive parts and equipment.

### *Customer Support*

Customer service and support are very important to TRW. For instance, TRW has developed a worldwide organization to meet the needs of oil producers who use company-made pumps. To provide fast and efficient service, TRW has opened branch repair and service plants in key oil-producing locations throughout the world. TRW is able to provide 48-hour replacement service, and in many instances a new TRW pumping system can be installed and operating in a day.

### 9.3 CORPORATE STRATEGY

Once a year each division and subsidiary at TRW prepares a five-year planning projection of its sales, earnings, assets, cash flow and other related data. The plan describes the various market elements—size, competitors, share and position regarding technology, customer relations, etc. It also includes estimates of new business opportunities, and these are compared with the company's previously determined goals, objectives and guidelines. Strategic issues, such as opening or closing new plants, entering new markets or leaving old markets are then presented to the CEO for study and discussion.

As a general policy, TRW is conservative in its business affairs and emphasizes quality of balance sheet and income statement. Within this framework, TRW places primary emphasis on the following elements of business policy:

- Product, market and geographic diversification in large, growing markets. Diversification helps make credible the establishment of long-range goals and the strategies to meet them.
- The capacity and willingness to change the business mix as times change and new opportunities emerge.
- A strong technological base in all products and services.
- A worldwide perspective which enhances opportunities and reduces long-term risks.
- Building on strength of market position, technological resources, geographical or production expertise.
- Understanding and anticipating political, social, economic and technological trends that will affect the business.

Table 9-3 presents TRW's current assessment, strategies and programs concerning its car and truck market. TRW hopes to increase its market share in the passenger car market and has programs to expand its rack and pinion steering manufacturing capabilities, expand its seat belt manufacturing and broaden its transportation electronics capability. TRW also plan to increase its worldwide distribution capabilities in the aftermarket.

#### 9.4 PRODUCTION AND OPERATIONS

TRW operates more than 100 manufacturing facilities in the United States and more than 90 manufacturing facilities in Europe and the rest of the world. TRW also leases domestic facilities. Of the 21.6 million total square feet of domestic properties owned and leased by TRW, 41 percent is used by the industrial and energy industry segment, 36 percent by electronics and space systems, and 23 percent by car and truck products manufacturing.

TABLE 9-3. TRW CAR AND TRUCK STRATEGY

| Product Class         | Industry Status   | TRW Strategies   | Current Programs  |
|-----------------------|---|--|---|
| Original Equipment    | <p><u>Passenger Car</u></p> <ul style="list-style-type: none"> <li>Worldwide trend to smaller cars</li> <li>Good growth prospects in key product areas due to safety, fuel economy and emission standards</li> <li>Cyclical earnings, domestically and internationally but the cycles don't necessarily coincide</li> </ul> <p><u>Truck and Off-Road</u></p> <ul style="list-style-type: none"> <li>Cyclical earnings</li> <li>Certain items have excellent growth prospects</li> </ul> | <p><u>Passenger Car</u></p> <ul style="list-style-type: none"> <li>Increase market share</li> <li>Invest aggressively in new growth opportunities</li> <li>Continued geographic and product diversification</li> </ul> <p><u>Truck and Off-Road</u></p> <ul style="list-style-type: none"> <li>Maintain strong market position domestically</li> <li>Increase overseas market penetration</li> <li>Introduce new products worldwide</li> </ul> | <p><u>Passenger Car</u></p> <ul style="list-style-type: none"> <li>Expansion of rack and pinion steering manufacturing capabilities</li> <li>Expansion of capacity in seat belt manufacture</li> <li>Broaden transportation electronics capability</li> <li>Phase out low margin products</li> </ul> <p><u>Truck and Off-Road</u></p> <ul style="list-style-type: none"> <li>Developing a position in the fluid power market</li> <li>Acquisition of Control Concepts</li> <li>Expansion of engineering capability</li> </ul> |
| Replacement Equipment | <ul style="list-style-type: none"> <li>Steady earnings growth</li> <li>Increasing demand for replacement parts because car population is growing</li> <li>Consumers keeping cars longer and maintaining them better due to higher cost and need for fuel economy</li> </ul>   | <ul style="list-style-type: none"> <li>Maintain good market share</li> <li>Increase worldwide distribution capabilities</li> <li>Add new products</li> </ul>   | <ul style="list-style-type: none"> <li>Establishment of new distribution center in Reno, Nevada</li> <li>Addition of new products to Service Line</li> <li>Programs to increase order fill rate and reduce order fill time</li> <li>Addition of new hand tool line</li> <li>Acquisition of C.E. Niehoff</li> </ul>  |

#### 9.4.1 Major Automotive Facilities

TRW has four major plants providing parts and components to the auto industry in North America. (See Figures 9-4 through 9-7.) These include:

- The Sterling Heights Plant. The Sterling Heights, Michigan, plant makes steering linkages, front-end suspension assemblies, power rack and pinion steering gears and automotive water pumps. The plant has 1 million square feet and employs 1,200 people.
- The Thompson Products Plant. The Thompson Products plant in St. Catharines, Ontario, makes engine valves, steering linkages and front and rear suspension parts and assemblies. The plant has 900,000 square feet and employs 900 people.
- The Ramsey Corporation Plants. Two Ramsey Corporation plants are in St. Louis, Missouri. The plants manufacture internal combustion engine piston rings, sealing rings and industrial retaining rings. Seven hundred fifty people work in the 600,000-square-foot facility.
- Valve Division Plant. The TRW Valve Division plant in Cleveland, Ohio, employs 1,800 people and covers 800,000 square feet. The plant produces automotive engine valves, valve seat inserts, valve retainer locks and caps, valve rotating mechanisms, extrusions, castings and forged pistons.

TRW also has several important overseas operations mostly 100 percent owned. These are described below.

- Thompson Ramco Argentina S.A.I.C.F. in Cordoba, Argentina, makes engine and chassis components.
- TRW Gemmer Thompson, S.A., in Sao Paulo, Brazil, makes engine and chassis components.
- Tokai TRW & Company, Ltd., in Kasugai City, Aichi, Japan, makes steering linkages, ball joints and pinion steering gears.
- Teves-Thompson GmbH, Barsinghausen, West Germany, has three plants in Germany and two in France making engine valves, piston rings, cylinder liners and oil control rings.



Company TRW (Chassis Components) County \_\_\_\_\_ Plant Size 900,000 sq ft

Plant Thompson Products Congressional District \_\_\_\_\_

Address P.O. Box 3004  
St. Catharines,  
Ontario, CANADA  
L2R785

Standard Metropolitan Statistical Area \_\_\_\_\_ No. of Employees 900

Telephone (416) 685-8411 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Engine valves<br>Steering linkage<br>Front and rear<br>suspension parts and<br>assemblies | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 9-5. THOMPSON PRODUCTS PLANT





TRW (Engine Components)  
 Company \_\_\_\_\_ County \_\_\_\_\_ Plant Size 800,000 sq ft

TRW Valve Division  
 Plant \_\_\_\_\_ Congressional District \_\_\_\_\_

1455 E. 185th St.  
 Address \_\_\_\_\_ Standard Metropolitan No. of Employees 1,800  
 Cleveland, OH 44110  
 Statistical Area \_\_\_\_\_

Telephone (216) 383-2121 Primary SIC Code(s) \_\_\_\_\_

| Products (Automotive)   | Capacity | Processes Used | Consumed by (Automotive) |
|---|----------|----------------|--------------------------|
| Automotive engine valves<br>Valve seat inserts<br>Valve retainer locks and caps<br>Valve rotating mechanisms<br>Extrusions<br>Castings and forged pistons | N.C.A.   | N.C.A.         | N.C.A.                   |

FIGURE 9-7. TRW VALVE DIVISION PLANT

- TRW Valves, Ltd., in Wednesday, England, has four plants in the United Kingdom that makes engine valves and valve forgings.
- Bayerisches Leichtmetallwerk in Munich, Germany, has one plant which makes forged gears and precision forgings.
- Repa Feinstanzwerk, GmbH in Aldorf, Germany, has two plants in Germany and one in Austria that make seat belts.
- TRW Clifford, Ltd., in Leicester, England, has four plants in the United Kingdom making steering wheels, aluminum castings, brake shoes and precision fasteners.
- Cam Gears, Ltd., Aitchin, England, has five plants in the United Kingdom which make manual and power-assisted steering mechanisms.
- Ehrenreich GmbH in Dusseldorf, Germany, has six plants in Germany making steering mechanisms, machine tools and forgings.
- Gemmer France in Suresnes, France has one plant which makes steering mechanisms and forgings.
- TRW Italia, SpA in Brescia, Italy, has one plant which makes steering mechanisms.
- Tornilleria Fina Navarra SA in Pamphona, Spain, a TRW affiliate, has one plant which makes steering mechanisms.
- TRW Products, Ltd., Marrickville, Australia, makes valves, steering gears and seat belt systems.
- Cam-TRW Pty., Ltd., Uitenhage, South Africa, makes automotive steering gears and seat belts.

#### 9.4.2 New Plants and Expansions

TRW is completing a new multimillion-dollar engineering center in Germany, where work will be done on the development of steering gears, linkage, and suspension joints for all types of vehicles. This center will place special emphasis on the field of hydraulics. Major automotive-related

expansions planned by TRW include:

- Rack and Pinion Steering Capacity. TRW provided 3.3 million rack and pinion steering gears to the worldwide automotive industry in 1978 and expects to double that figure by 1982. To expand U.S. production of power rack and pinion gears, TRW Michigan Division will spend \$6.6 million for new equipment in existing facilities and \$10.1 million for a new facility in Greenville, North Carolina.
- TRW-Canada Expansion. TRW Canada, Ltd., Thompson Products Division, plans a \$10 million program to accommodate future growth in its primary products—steering linkages and automotive valves. About one-third of the \$10 million will fund expansion of a present facility. Following the expansion, this plant will become a fully integrated forging and heat treating plant. A second plant will be redesigned as a highly mechanized machining and assembly operation.
- New Headquarters. TRW announced in December that it had agreed to purchase a 92-acre estate in Lyndhurst, an eastern suburb of Cleveland, for its new headquarters. The company plans to move its corporate offices to the site, approximately ten miles south of the current offices, in about three years. Preliminary estimates for construction costs of the headquarters stand at \$20 million to \$25 million.

## 9.5 FINANCIAL STATUS

TRW has been financially quite strong in recent years and good growth is predicted for the '80s.

### 9.5.1 Operating Analysis

TRW has had quite a successful financial performance over the last five years (see Figure 9-8). Earnings and sales reached record levels in each of the years, and return on equity and the ratio of operating income to sales were steady throughout the period. The return on assets has improved substantially and has allowed the company to maintain return on equity despite a significant reduction in the percentage of debt in its capital structure.

| Year | Sales<br>(\$Millions) | Earnings<br>(\$Millions) | Return on<br>Equity, Percent | Operating Income*<br>Sales | Percent |
|------|-----------------------|--------------------------|------------------------------|----------------------------|---------|
| 79   | 4,560                 | 195                      | 20.8                         | 11.3                       |         |
| 78   | 3,787                 | 174                      | 22.1                         | 11.9                       |         |
| 77   | 3,264                 | 154                      | 22.5                         | 12.2                       |         |
| 76   | 2,929                 | 133                      | 22.3                         | 12.2                       |         |
| 75   | 2,586                 | 104                      | 18.9                         | 11.6                       |         |
| 74   | 2,486                 | 101                      | 20.6                         | 11.8                       |         |

| Year | Earnings<br>Total Assets | Percent | Sales<br>Assets | Earnings<br>Sales | Percent |
|------|--------------------------|---------|-----------------|-------------------|---------|
| 79   | 7.7                      |         | 1.79            | 4.3               |         |
| 78   | 7.9                      |         | 1.72            | 4.6               |         |
| 77   | 7.8                      |         | 1.66            | 4.7               |         |
| 76   | 7.5                      |         | 1.67            | 4.5               |         |
| 75   | 6.0                      |         | 1.50            | 4.0               |         |
| 74   | 6.3                      |         | 1.54            | 4.1               |         |

\*Operating Income = Sales - Cost of Goods Sold - Selling, General and Administrative Expenses, Before Depreciation, Interest, and Income Taxes.

FIGURE 9-8. TRW OPERATING ANALYSIS

For 1979, sales rose 20 percent, year to year, and net income rose 12 percent, largely due to a strong showing in the industrial and energy group. Profits were almost steady in the car and truck group for four reasons:

- Heavy start-up expenses for rack and pinion steering for small cars
- Increased R&D and development expenses in transportation electronics
- Reevaluation of assets in one of the company's recent acquisitions
- Some inefficiencies during the shift to new car models.

Strong points of TRW's current sales include rack and pinion steering, seat belts, the heavy truck business and the small car market as well as international sales as a whole. The company projects modest earnings growth of the car and truck segment in 1980 as well as for the entire company. Stock analysts have expressed mixed views about the short-term prospects for TRW. However, for the long term, analysts are optimistic due to the company's diversification, strength in the energy market and growing markets in electronics and space, and strength in the international and replacement automotive markets.

#### 9.5.2 Capital Analysis

TRW has moved from a ratio of long-term debt to capitalization of more than 37 percent in 1974 to one near 26 percent in 1979. According to Chairman Ruben F. Mettler, the company has now reached its capital structure goal (see Figure 9-9).

Capital spending in 1980 is expected to be up to about \$240 million. According to Dr. Mettler, TRW will generate \$2-2.5 billion of cash over the next five years. With a 35 percent dividend payout, \$1.25 billion will be left for investment in current businesses. This leaves about \$300 million cash flexibility for product line expansions, cash acquisitions, or totally new market development.

#### 9.6 RESEARCH AND DEVELOPMENT

Research and development constitute an important part of TRW's activities because of the generally high scientific and engineering content of many of its products. During

## Sources

| Year | Sources |                        |          |              |                           |  |
|------|---------|------------------------|----------|--------------|---------------------------|--|
|      | Sales   | P/E Ratio <sup>1</sup> | Earnings | Depreciation | Changes in Long-Term Debt | Changes in Owners' Equity Other Than Retained Earnings |
| 79   | 4,560   | 7.0-5.0                | 195      | 112          | (1)                       | (0.1)  |
| 78   | 3,787   | 7.8-5.1                | 174      | 98.2         | 30                        | 2.2  |
| 77   | 3,264   | 8.5-6.5                | 154      | 90.8         | 25                        | 2.8  |
| 76   | 2,929   | 9.5-6.6                | 133      | 80.1         | (46)                      | 0.3  |
| 75   | 2,586   | 9.7-4.6                | 104      | 70.9         | (25)                      | 13.5   |
| 74   | 2,486   | 6.7-3.3                | 101      | 68.3         | 157                       | (4.1)  |

## Uses

| Year | Uses                      |                      |           |  |                          | Current Ratio |
|------|---------------------------|----------------------|-----------|--|--------------------------|---------------|
|      | Change in Working Capital | Capital Expenditures | Dividends | Long-Term Debt <sup>2</sup> Capitalization % | Cap. Exp. Total Assets % |               |
| 79   | (6)                       | 200                  | 74.5      | 25.8   | 9.8                      | 1.6           |
| 78   | 63.3                      | 136                  | 68.3      | 28.1   | 9.5                      | 1.7           |
| 77   | 44.6                      | 126                  | 62.4      | 28.8   | 9.0                      | 1.8           |
| 76   | 19.3                      | 100                  | 56.6      | 29.4   | 8.6                      | 1.8           |
| 75   | (11)                      | 119                  | 50.8      | 34.0   | 6.2                      | 2.0           |
| 74   | 164.6                     | 138                  | 48.4      | 37.1   | 6.1                      | 1.9           |

Dollar figures are in millions

<sup>1</sup> Range for the Year<sup>2</sup> Capitalization Defined as Total Liabilities - Current Liabilities<sup>3</sup> Operating Profit/Interest

FIGURE 9-9. TRW CAPITAL ANALYSIS

1979 TRW spent approximately \$54 million for research and development related to the creation and start-up of new products and processes.

In the automotive area, TRW is carrying on extensive research in combustion, metallurgy, materials, fuels and alternate power sources. The company is seeking to develop internal engine seals (piston rings) that would stop the contamination of oil and eliminate the necessity for oil changes. TRW is also developing or reviewing several major potential electronic systems for vehicles. Some of these may be adaptations of non-automotive designs. For example TRW markets an electronic control system to monitor and reduce fuel consumption in industrial plants and is developing electrohydraulic controls for construction and agriculture machinery.

Substantial research and development effort is also being devoted to proprietary seat belt mechanisms for passenger cars. One new product is an emergency pretensioning device which draws the passenger snugly back into the seat within five thousandths of a second—to better secure him during a crash.

Other R&D projects include radar-controlled brakes, alternate fuel sources and electronic engine controls.

## 9.7 LABOR RELATIONS

To hear and respond to employee concerns and ideas, TRW has an ongoing program of small group sensing meetings. The company offers educational assistance or training to enable employees to develop their talents. In addition, TRW attempts to provide increased employee participation in the company's operations. For example, when one TRW facility doubled in size, a joint management and employee task force redesigned the plant organization. In the new design, employees work in teams and are compensated for the number and level of skills they have mastered.

In 1979, 4,300 production and maintenance employees went on strike at four Cleveland TRW plants following the expiration of a three-year contract. The strike by members of the Aircraft Workers Alliance, Inc., halted operations at the four facilities, including two automotive parts production plants and an auto aftermarket distribution center. Disagreement existed on both monetary and non-monetary issues. TRW said that the strike was the first at any Cleveland-area operation in the company's 79-year history.



The strike was settled after ten days. Based on certain assumptions about inflation, the contract represented a 36 percent increase in the average wage over three years. The new contract also included improvements in pension, health, dental and eye care benefits and increased time-off provisions.

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